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APRIL 1994

Macworld

THE MACINTOSH® MAGAZINE

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Mac LC 575

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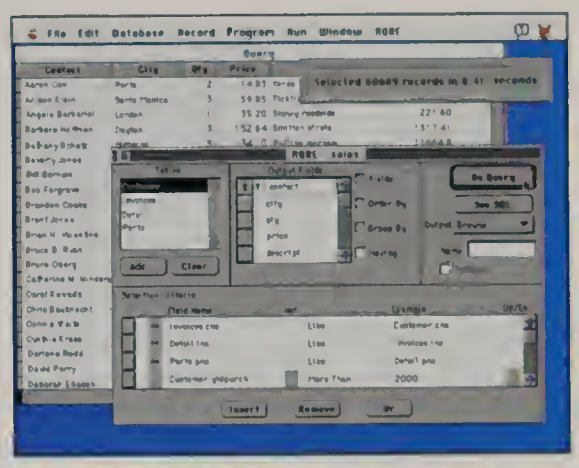

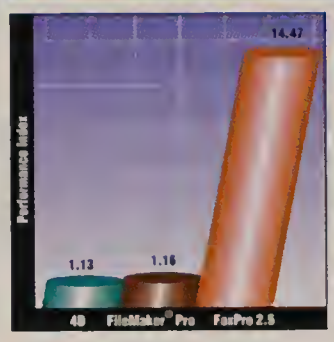

Query multiple tables at once using Relational Query By Example. Then see the answers in a flash. (LEFT) On average, new FoxPro 2.5 for the Macintosh is 13 times faster than FileMaker® Pro and 4th Dimension.*

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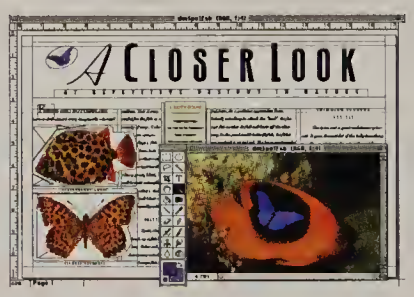

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To learn more about what Intel compatibility and price/performance can mean to you, call 1-800-395-7009, extension 83.

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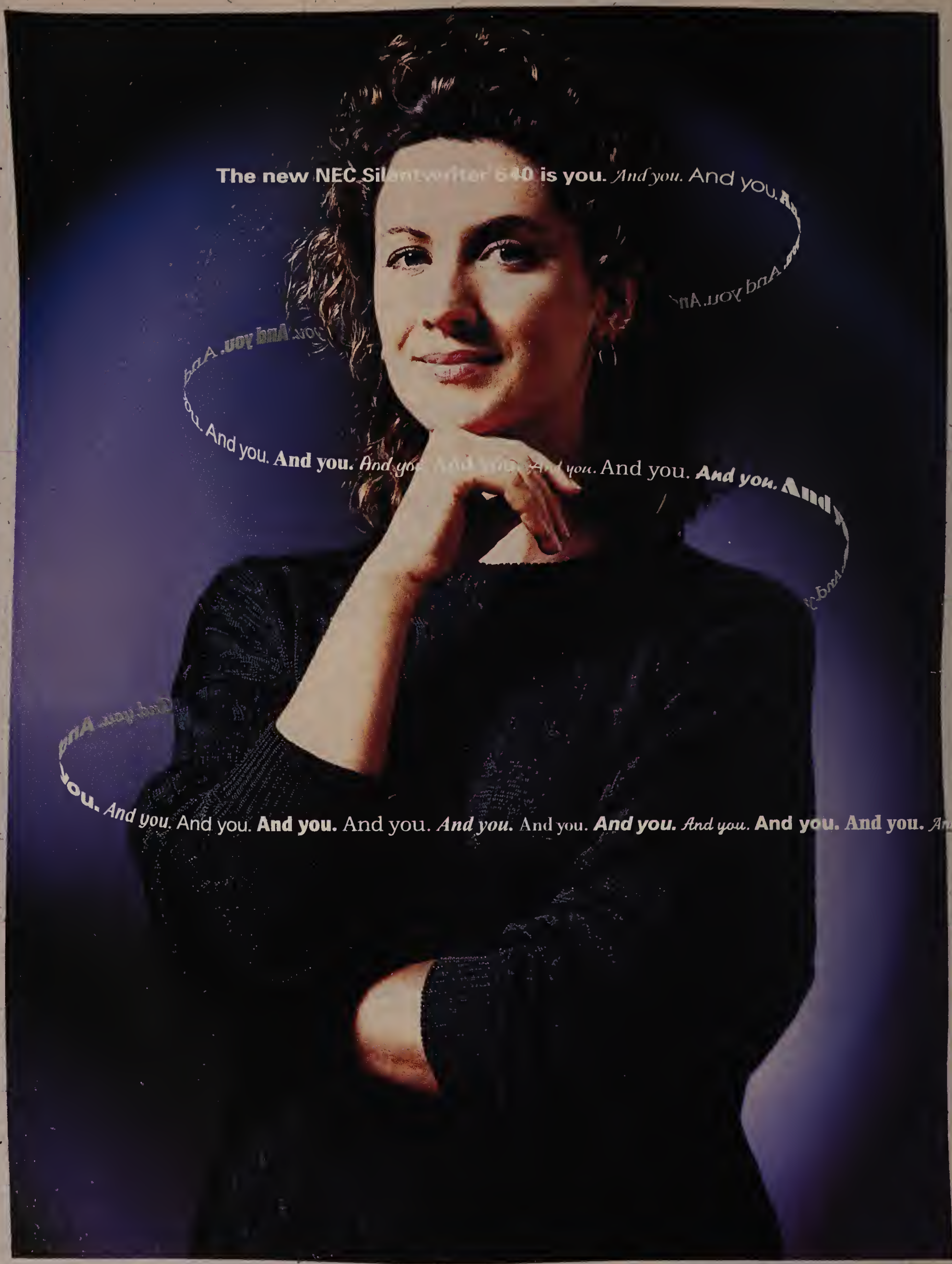

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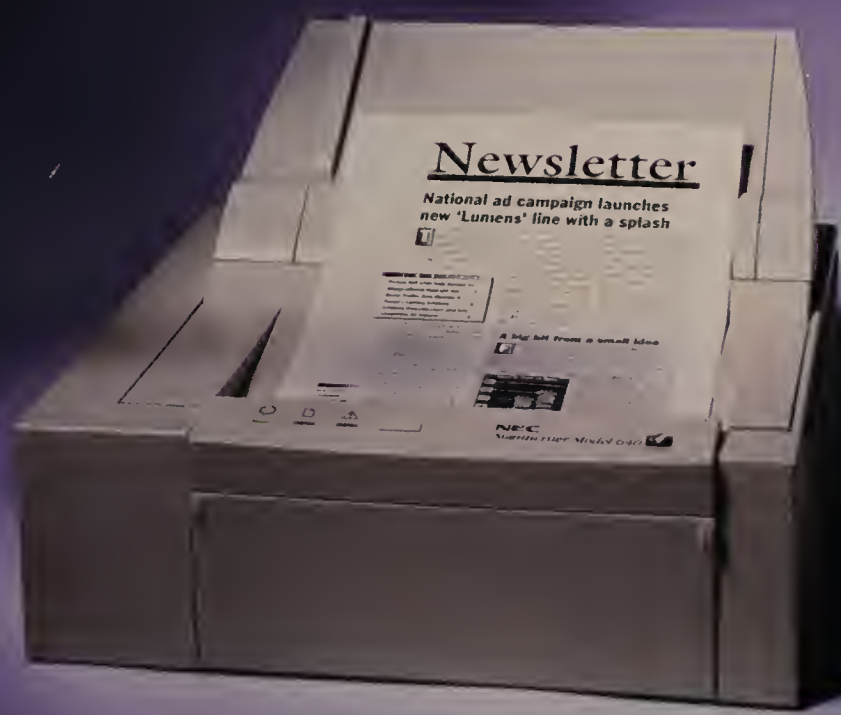

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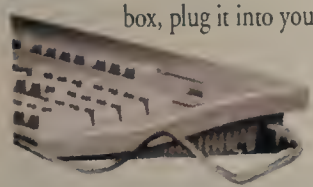

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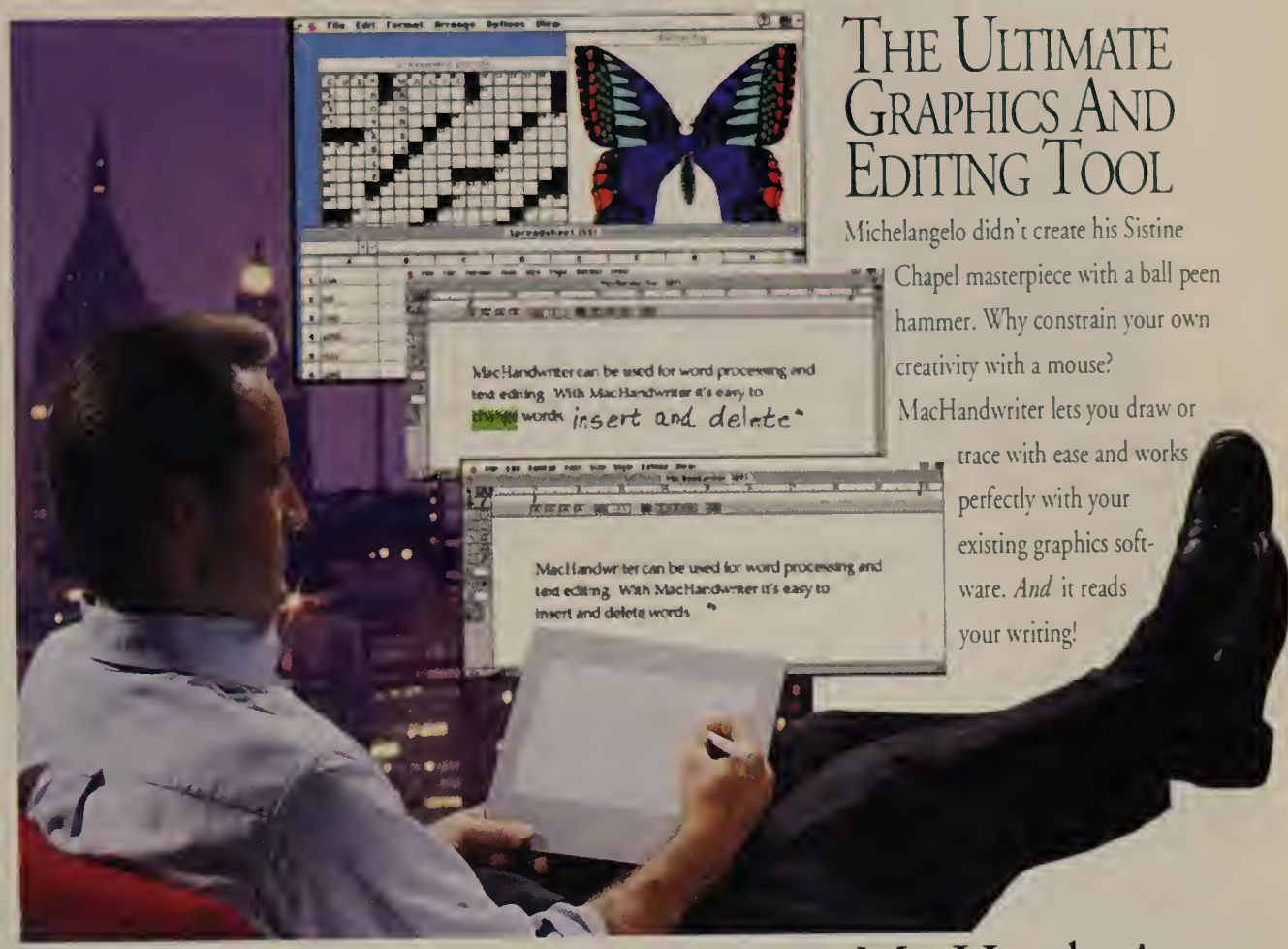

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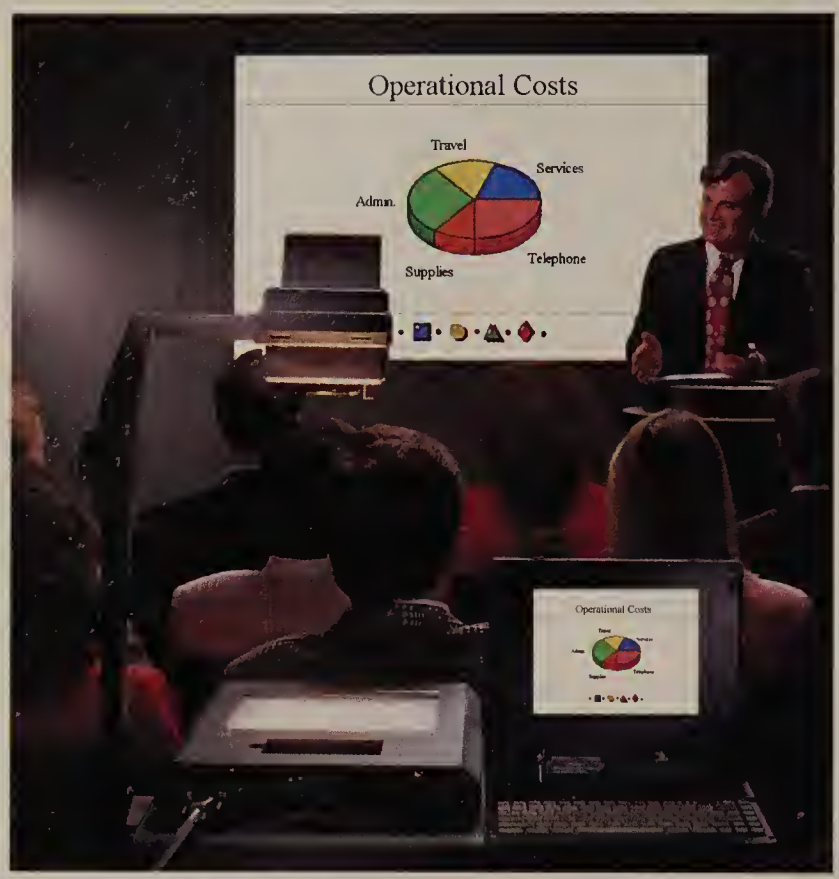

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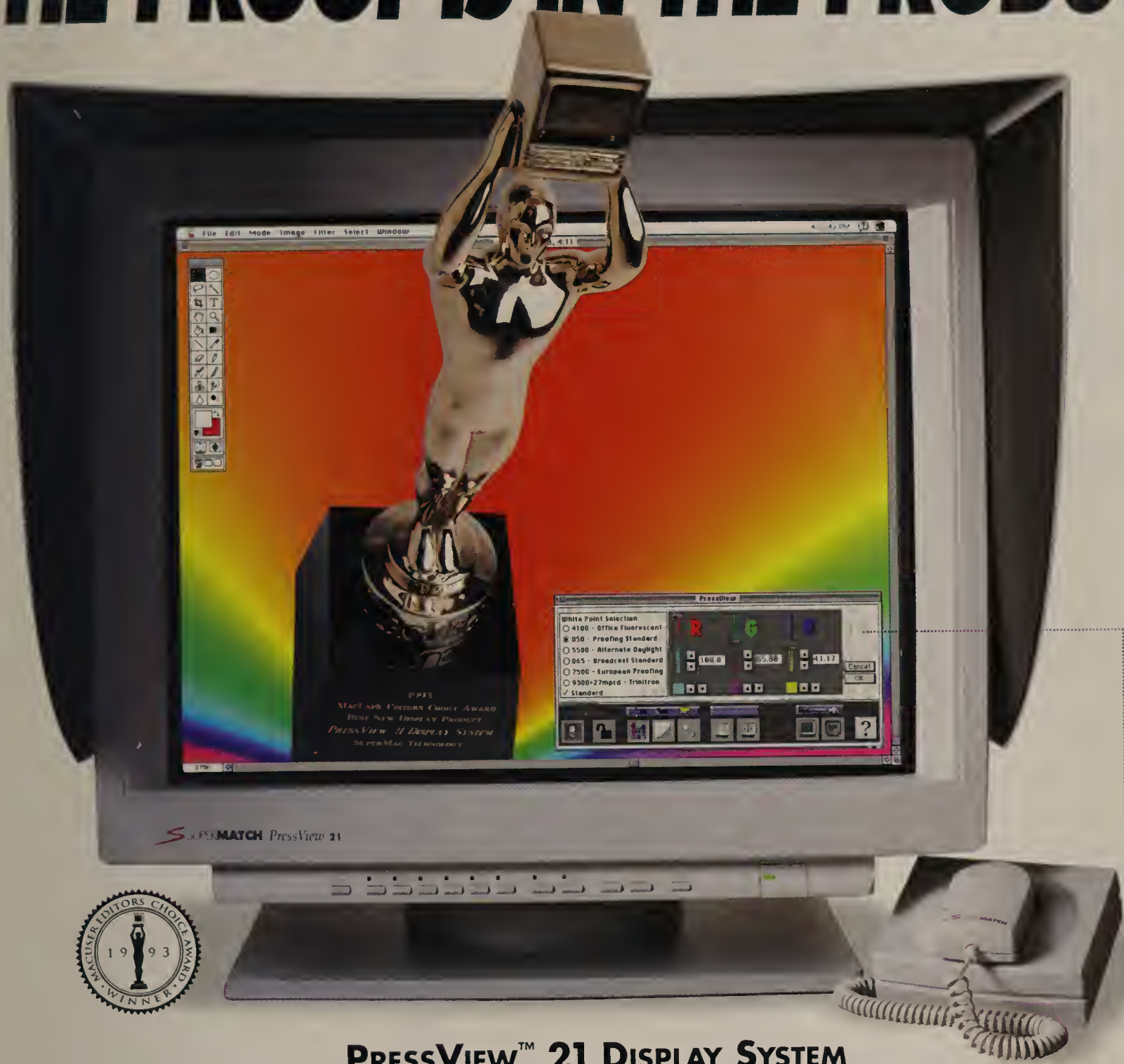

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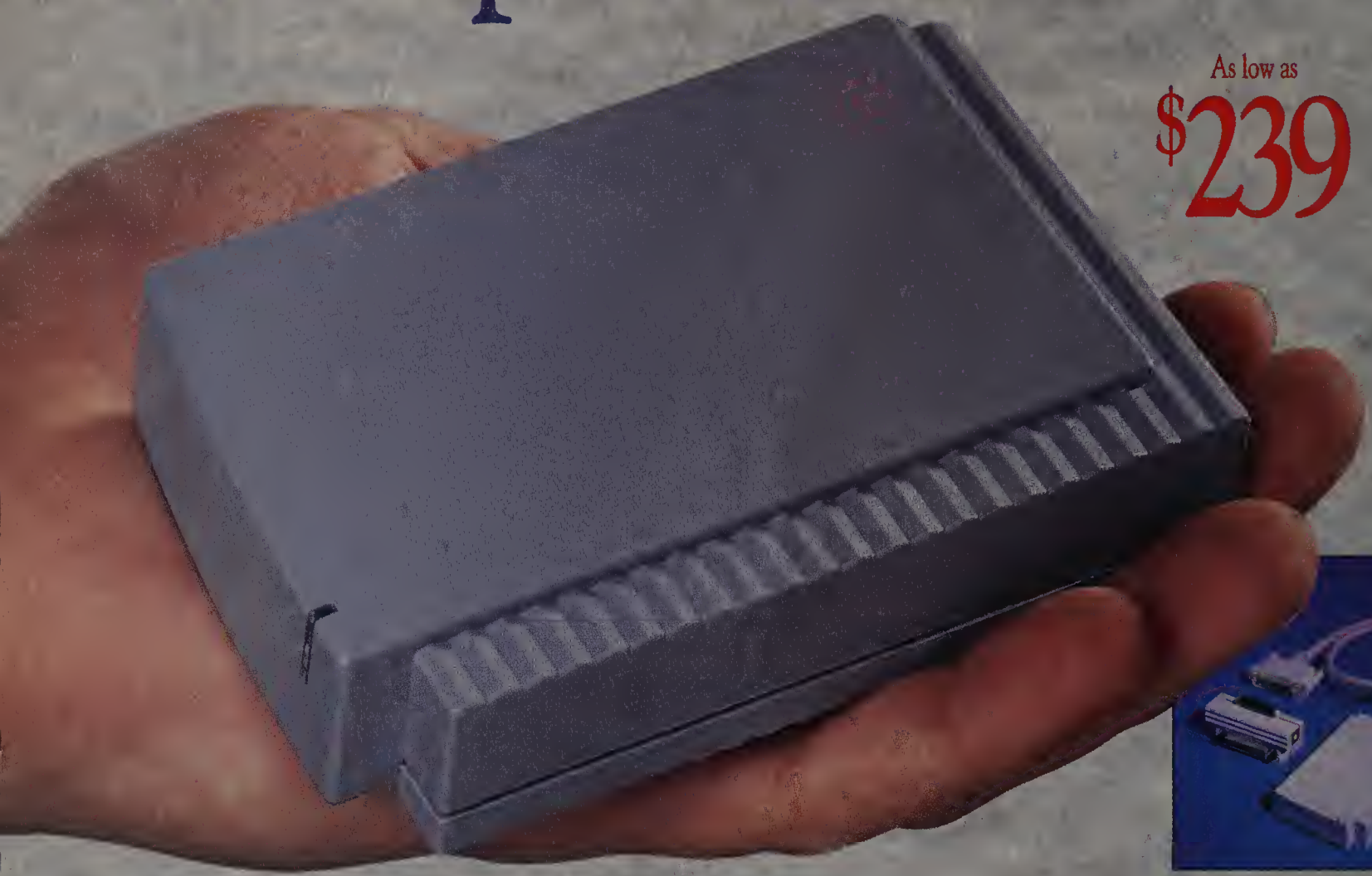

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InfoFAX

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BY ADRIAN MELLO

Upgrading to PowerPC

Mapping a route to new Macs

THE EARLY REPORTS ON THE imminent PowerPC-based Macintoshes are remarkably positive about these machines' performance, price, and compatibility. Even industry curmudgeons are optimistic about the Mac's transition to PowerPC. It's easy to get caught up in the excitement, so let's think about some practical considerations before getting swept away by new-technology fever. Should you buy a PowerPC-based Mac? What kinds of software will be available and how should you choose it? If you own a Mac now, what are your upgrade options?

Should You Buy a PowerPC Mac?

Like many people, I will probably buy a PowerPC Mac soon after it arrives. I'm not always an early adopter (I passed on the Newton), but PowerPC is clearly the Mac's future, and it will be accompanied at introduction by some swift new software. If you don't already have a Mac, you should probably buy a PowerPC machine unless you are on a really tight budget. Within a couple of years Apple will completely convert its computer line to use PowerPC chips, so you might as well be on board as applications are redesigned to take advantage of the performance offered by the PowerPC's RISC technology. From everything I have heard and seen, software compatibility should be excellent, so you will have all the variety of the Mac software base to choose from as soon as the PowerPC machines arrive. Apple has also promised aggressive prices, so it's likely that there will be little, if any, price premium for a PowerPC Mac versus current midrange and high-end Macs.

Buyers who must squeeze every penny should consider the lower-priced 040-based Macs. People with limited performance demands will still save quite a bit of money by purchasing models such as the LC 475 and 575, the Performa 475 and 476, and the Quadra 605.

Software Is the Key

If you already own a Mac, deciding whether you should upgrade it is a more complex process. Software is the most important consideration. Unless you work in an area where faster computing means big benefits, you may not need to upgrade right away. The initial benefit of a PowerPC Mac is that software written specifically for it, called PowerPC native software, will run much faster than currently possible. This is important if your work is in a field such as publishing, graphics, mathematics, science, or engineering and demands a lot of processing power. Although existing applications written for the 68000 family of processors will still run under emulation on PowerPC Macs, at first the new systems won't be faster than today's comparable models. Apple says that in most cases the emulated performance will range from that of a fast 030 to a slow 040—say, somewhere between a IIfx and a Quadra 700. That's great if you own a slower Mac, but it's a step backward if you already own a fast model such as the Quadra 800.

The point is, if you need an immediate performance improvement, you should find out if and when native PowerPC versions will be available for the applications you use the most. A number of vendors expect to ship native versions of their software on introduction of the PowerPC models; others will ship later (see "Developers Back PowerPC," *News, Macworld*, February 1994). For example, FrameMaker 4.0, Fractal Painter, WordPerfect, and Mathematica will be available when the PowerPC Macintoshes come out. However, the full native version of Adobe Photoshop won't be available until summer. If you spend most of your time in QuarkXPress or Photoshop, you won't see a speed improvement from a PowerPC at introduction. To keep you up-to-date on software introductions and other developments important to the transition to PowerPC-based Macs, in this issue we introduce a new section called *PowerPC News*.

Software Installation Conundrum

As vendors make native applications available, they may offer new and unfamiliar ways of packaging and installing them. Some vendors might sell separate versions of their software, one for existing 680X0 Macs and another for PowerPC Macs. Vendors offering separately packaged PowerPC versions are likely to charge more for a PowerPC Mac version than for a 680X0 Mac version. If in addition to your PowerPC Mac you will use a PowerBook or a 680X0 desktop Mac, you'll need to keep separate versions of software for the two types of machines. Separate versions are the least likely method of distribution because they are inconvenient.

Another option, called a fat-binary application, contains PowerPC native code and 680X0 code all in the same program. Whether you run the program on a 680X0-based Mac or a PowerPC Mac, it runs the appropriate code. The fat-binary approach lets you move your hard drive between different machines and lets network users access a server application without having to install two different versions. But fat-binary applications are

continues

called fat for a reason. Although not as big as two separate versions combined, a fat-binary application is quite a bit bigger than a single-platform version. That means a fat-binary program will probably require more floppies in the box it ships in, and will definitely take more room on your hard disk.

A third option is a smart installer, which knows whether it is loading software onto a PowerPC Mac or a 680X0 Mac and installs the appropriate version.

Hardware Upgrades

If you already own a Mac, you may have a number of options for upgrading to a PowerPC Mac. One option will be Apple's announced logic-board upgrades for the Centris 610, 650, and 660AV; the Quadra 610, 650, 800, and 840AV; the IIvx; and the Performa 600. This way you keep your storage devices, power supply, and case, and get an essentially new computer with PowerPC Mac performance, because the logic board is identical.

Apple has also announced an upgrade board that fits into an 040 PDS slot; Apple claims that the board will run native PowerPC applications two to four times as fast as an 040 Mac with current versions of the same apps (see "Apple Unveils First PowerPC Product," *News, Macworld*, March 1994). The board will be available for the same machines as the logic-board replacement, except for the AV Macs and the Centris and Quadra 610. The board will also work with the Quadra 700, 900, and 950, for which there are no announced logic-board upgrades. At under $700 this board is expected to cost less than a full-blown logic-board upgrade, but it may not be as fast, depending on the machine you are upgrading. The PowerPC processor on the add-in board runs at double the clock rate of the logic board in the Mac in which it's installed. For example, in a 20MHz Centris 610, the add-in board will run at 40MHz, and in a 33MHz Quadra 650 it will run at 66MHz.

A third option: DayStar Digital (404/967-2077) has announced upgrade boards that take a different approach even though its boards use the same (licensed) ROMs as the Apple board. Instead of clock-doubling, DayStar's boards preserve the speed of their PowerPC chip regardless of the speed of the upgraded machine. Clock speeds on the first DayStar boards will be 60MHz, 66MHz, and 80MHz. You'll pay more for the speed of the DayStar boards—they will start at under $1500. DayStar PowerPC upgrades for the Quadra 650, 700, 800, 900, and 950 and the Centris 650 should ship when Apple introduces its PowerPC models. Versions for all color Macs are due sometime this year.

Whatever hardware upgrade strategy you choose, before you buy, check whether the software you rely on will be available. If it won't be, you might as well wait until the native versions are ready. When you're investigating PowerPC software, make sure it can be installed in a way that will not cause problems for you or your organization. If you need a new high-performance Mac, you might as well get a PowerPC Mac. In general, if saving every dollar is more important than extra performance, then you should probably choose one of the low-cost 040 Macs. Finally, it's virtually certain that there is a PowerPC machine in your future if you continue using a Mac. Someday you'll want to take advantage of all the innovation that PowerPC technology will provide. That's why, if Apple's plans turn out as expected, I'm going to get mine right away. After all, innovation is why I bought a Mac in the first place. m

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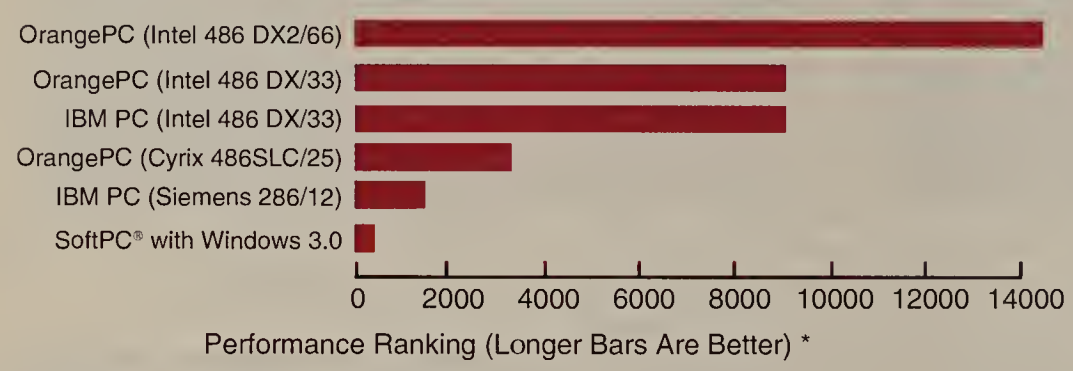

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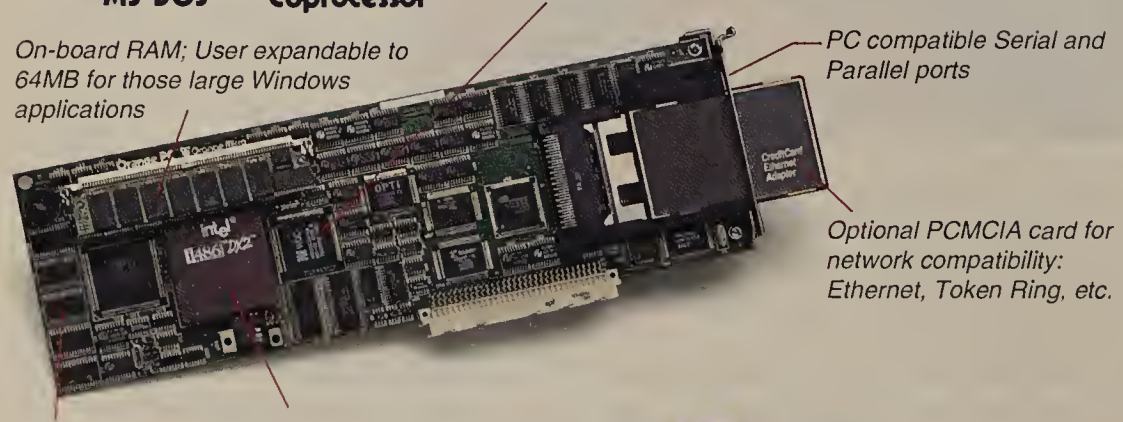

Mac User June/93

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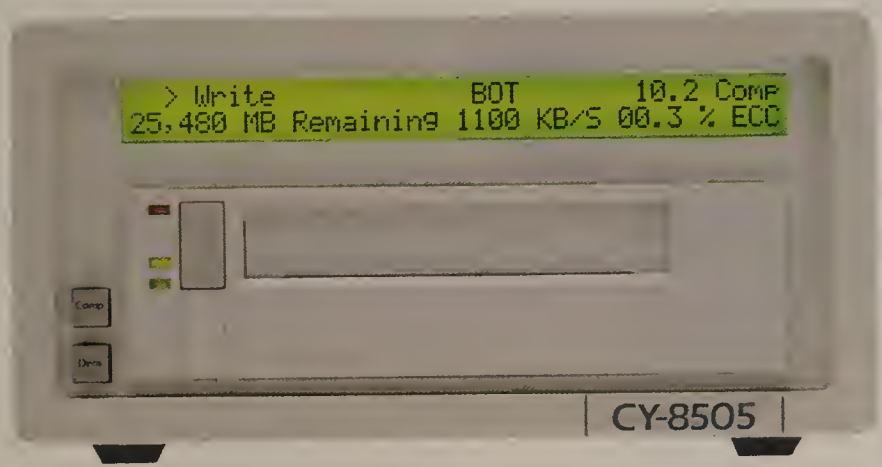

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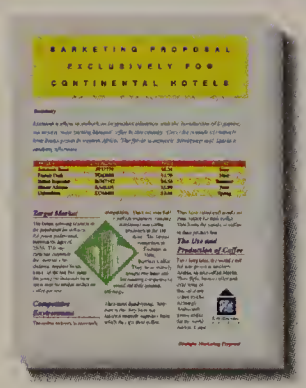
With MacWrite Pro

you can do all the things you can do with competing programs, except for spending a whole lot of money. Yes, this happens to be a wordy headline, but then again, this program's so simple to use, it's easy to get carried away. And when you get carried away, you tend to ramble on with complete disreg



Here it is in a nutshell: for merely half the price of most other programs, MacWrite® Pro 1.5 brings you all the features and capabilities you need in a word processing program. (In a smaller nutshell, it's "value.")

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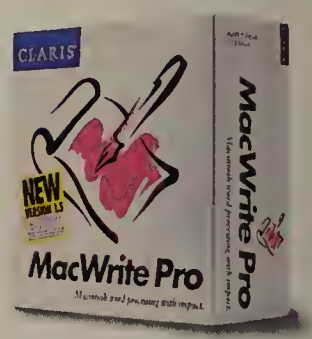

We've got lots more to tell you, but we've run out of space. So call 1-800-544-8554, ext. 262 for more information.

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APRIL 1994

Letters

Don't Pooh-Pooh My FPU!

IT'S 1993, ANOTHER LINE OF NEW MAC models is reviewed, and my conspiracy theory is reaffirmed. You took another nasty stab at the need for a floating-point math unit in "New 040 Macs" (December 1993). This time, it's not going to go unchallenged.

For years, you've told us that the need for a math coprocessor was obscure and limited. I dare you to compile a comprehensive list of current software that makes use of an FPU. You'll find yourself in the company of many Photoshop filters, spreadsheets from ClarisWorks to Excel, data-analysis packages, 3-D modelers and renderers, and QuickTime-editing packages. These aren't obscure, niche software products—they're best-sellers, and the reason many people bought their Macs in the first place!

The brain-dead LC040 (or 486SX for that matter) breed of FPU-disabled CPUs was a concept driven by manufacturing-yield problems, not by consumer needs. When called upon, an FPU provides breathtaking improvements in calculation speed for anyone who has one in their Mac. Apple deserves kudos for providing FPU options and for moving from surface-mount CPUs to swappable sockets.

Call a truce between your writers and all the math chips in your lab Macs.

Shawn Smith
Minneapolis, Minnesota

FPUs are helpful, but because Apple has made so many models without them, most software is based on integer math for compatibility. The few applications designed to support Macs both with and without FPUs—like Microsoft Excel—usually see only a small overall boost in performance because the developers focus on the few calculations that would benefit most from a floating-point chip rather than engineer the entire program to support both integer and floating-point calculations. Perhaps Apple's move to the PowerPC chip will provide a large enough base for developers to really use the advantages of floating-point math.—Ed

Presentation Madness

I MAKE SLIDES. LOTS AND LOTS OF slides. So I read Jim Heid's "Planning the Perfect Presentation" with interest, until I came across the following remark, "if you're shopping for a presentation program, consider PowerPoint first—it's a better program than Persuasion" (*Working Smart*, January 1994).

I've been using Persuasion successfully and happily for the past two years. When I've been asked to help others in my organization with PowerPoint, I have found the program to be slow, clunky, and lacking in options. I haven't seen the latest version of PowerPoint, but maybe you ought to more clearly qualify your remarks rather than making product recommendations apparently based on one feature like color selection. Also, PICTs and graded backgrounds can significantly slow print times on a film recorder.

Beth Saltzman
San Francisco, California

JIM HEID'S COLUMN ON PRESENTATIONS contains many good ideas, but he didn't really explain the function of computer-generated pages with visuals on them—they're for use as speaker's notes. Speaker's note pages do have one visual per page, but the blank space below is not for "doodles." This space is where the presenter can add notes and reminders. I'm a Persuasion user and find this feature very helpful. While the content of slides or overheads must be concise, the memo function allows me to enter notes to myself. When giving my presentation, I'm guided by my speaker's notes, each page of which holds a reduced copy of the slide, followed by my notes.

Barry-Craig Johansen
Red Wing, Minnesota

THANKS TO JIM HEID FOR ANOTHER helpful column full of common sense and practical advice.

But seriously—I have always preferred wearing a skirt when I give presentations. Does he really recommend that I wear slacks?

Cindy Greene
Los Alamitos, California

My recommendation that users consider PowerPoint first was based on more than just color selection. At the time the column was written, Persuasion was showing its age and was well behind PowerPoint in many areas. (The new Persuasion 4.0 looks much stronger.) As for Cindy Greene's, um, query: I'll always choose skirts over slacks. Except for myself —Jim Heid

Happily Seeing in Color

ADRIAN MELLO MISSED THE JET IN his "Choosing a PowerBook" column (*State of the Mac*, January 1994). He maligned the 165c as a battery hog compared with the black-and-white 165. I'm typing this on a 165c, aboard a jet. To extend the battery life, just turn off the color with the Monitors control panel. Slowing the processor and carrying an extra battery gives you a machine that is perfectly acceptable for word processing. His sug-

continues

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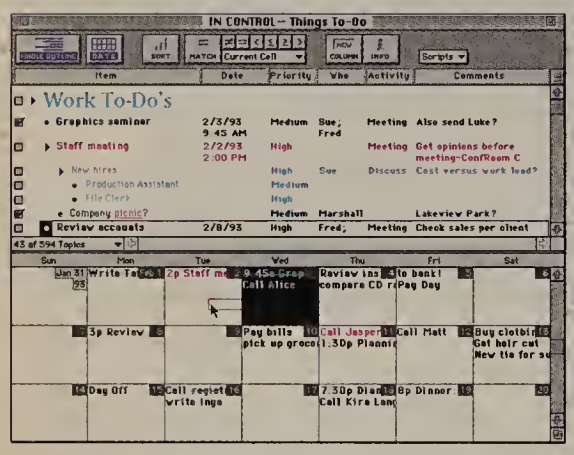

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4½ — MacUser ★★★★ — Macworld ◆◆◆◆ — MacWEEK

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CORRECTIONS

- *Synex's Bar Code Pro supports the common inventory symbology Code 39, not Code 25, in "Industrial-Strength Bar Codes,"* At Work *news, March 1994.*
- *In the February* New Products *section, Remote Measurement Systems' telephone number should have been listed as 206/328-2255, and Rocky Mountain Digital Peeks' toll-free number should have been 800/266-7637.*
- *In the February review of MacGrade 1.5.5, CalEd Software's phone number grew an extra digit. The correct number is 408/625-6667.*
- *Tom Rielly's name was incorrectly spelled "Reilly" in February's "Macintosh Innovations" feature.*
- *Contrary to the January feature "Databases That Work," Blyth Software is not yet shipping Omnis.*
- *In the January* New Products *section, we incorrectly stated that Mantis Development's Living Desktop alters the System file.*

gestion that you buy a separate monitor for your office and use a black-and-white PowerBook doesn't do the trick when you want to take the PowerBook home or use it in a hotel. He also overlooked the fact that the 165c runs at 33MHz (versus the 165's 25MHz), and has a math coprocessor. For a minor difference in price, the 165c packs more power, and it's nice to work in color when you land.

Kelly Moorhead
Kailua-Kona, Hawaii

Apple Tech Support Explained

WHEN THE UPPER MOUSE BUTTON on my PowerBook 170 broke for the second time in six months, I wanted to know if it was something I was doing wrong or something wrong with my machine. I enclosed a note to that effect when I sent the machine in for its second repair. The computer came back fixed, but with nothing to explain the problem.

I wrote twice to people listed as working in Apple Service and requested an answer to my question but received no reply. I was becoming irritated with this show of corporate discourtesy when it finally came to me. What if there are no people there? What if Apple Service is simply the name of a department staffed by robots programmed to repair and return machines?

To test this theory, I went to my workshop, swept a collection of unsorted bolts, nuts, chips, wires, and screws into a box, enclosed a note reading, "It broke," and mailed the collection to the Apple Repair Center. Two weeks later, I received a box with an Apple mailing label. Inside was a device labeled PowerCrib. I had not read about this in *Macworld*, but knowing how important the education market is to Apple, I guessed at the machine's use. Sure enough, I could enter virtually any academic problem or question into the keyboard, and PowerCrib would write the answer—in cursive with a ballpoint pen—on my shirt cuff.

The moral: Don't send a holiday greeting card to Apple Service. It will come back wired for sound.

Edward Hartman
Moraga, California

On Reviews

I FOUND YOUR RECENT THREE-STAR rating of the AudioVision 14 Display intriguing (December 1993). Although you appear to appreciate the sound- and image-quality of the monitor, you criticize a 14-inch monitor for not being a 16- or 19-inch monitor. That strikes me as a pointless exercise. One hopes that when 16- and 19-inch versions of this monitor are introduced, you will revise this rating and simply compare this monitor against other, similarly sized monitors.

P.S. I enjoy Guy's columns.

Thomas G. Diebold
Portland, Maine

In December, we reviewed the AudioVision 14 alongside the Quadra 840AV in its intended environment—as part of a multimedia workstation. Under these conditions, the monitor simply didn't provide enough real estate to be useful. You can read how it fared against its peers in our January 1994 "Small Wonders" lab feature on 14- and 15-inch color monitors.—Ed.

I JUST READ THE REVIEW OF THE Apple PowerCD in the January 1994 issue. Jim Heid stated in the review that "you can still use the remote control when the drive is connected to a Mac." I own a PowerCD and cannot use the remote control when it is connected to my Mac and the Mac is on. When it is on, the PowerCD is in data mode and will only accept commands from my Mac. When my Mac is off, audio CDs play for two to three minutes and then stop when the PowerCD suddenly goes into data mode.

Since the software remote control of the PowerCD is so inadequate and the physical remote control will not work when my Mac is on, I rarely connect my

continues

The Apple Report On PowerPC

Number 2 – RISC Performance and Cross-Platform Compatibility

Many of the most popular applications have been or are being optimized to take advantage of the high-performance PowerPC processor.

PowerPC chips are faster and less expensive than Pentium chips – so are the personal computers they will run.

A complete Macintosh system with PowerPC will cost well under $2,500, but will offer better performance than higher-priced Pentium-based systems.

With SoftWindows, Macintosh with PowerPC will have the ability to run DOS and Windows applications, unmodified.

For more information about Macintosh with PowerPC, call 1-800-732-3131, ext. 150, in the U.S. We'll send you a copy of our informative, free booklet, *PowerPC Technology: The Power Behind the Next Generation of Macintosh Systems*. In Canada, call 1-800-665-2775, ext. 910.

In the first half of 1994, Apple will introduce a new family of computers that already has the entire computer industry standing on end.

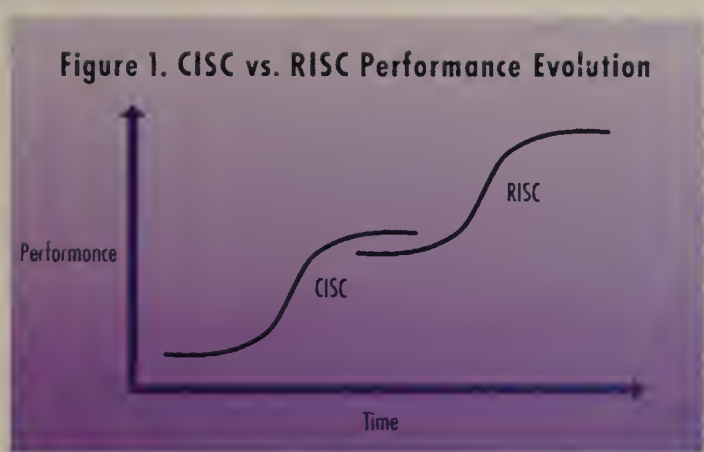
They will offer better performance than computers based on the X86 microprocessors. They will be extremely competitive on a price basis. And they will be compatible with Windows and DOS applications, by using SoftWindows software.

They will be based on the revolutionary new PowerPC™ microprocessor, created jointly by Apple, IBM and Motorola.

For the first time, desktop personal computers will take advantage of RISC chip architecture previously found only in high-performance workstations. This advance will make possible quantum improvements in the way we manage and work with information.

RISC vs. CISC.

Tremendous advances have been made in CISC architecture over the years. However, the physical limitations of the new, high-performance CISC design mean that CISC chips must be significantly bigger and more complex, and must run at hotter temperatures to perform the same tasks as comparable RISC chips. Consequently, the newer generation of CISC chips, like the Pentium, are much more expensive to manufacture. Which means that personal computers powered by PowerPC chips can offer a significant advantage in price as well as in performance.



As you can see on the chart, RISC microprocessors offer dramatically greater potential for growth, leading us well into the next century and increasing the practicality of features like voice recognition, videoconferencing, object-oriented software and multimedia capabilities – functions that will be integral to doing business in the 21st century.

More compatible personal computers.

Apple's new generation of Macintosh® personal computers built around the PowerPC chip offer the ability to run MS-DOS and Windows applications, as well as Macintosh software. Moving from one environment to the next will be seamless and, even more importantly, it will be effortless.

PC users who move to Macintosh with PowerPC will gain access to the large number of new applications which take advantage of the incredible performance of the new PowerPC chip.

Higher-performance optimized applications.

When PowerPC microprocessor-equipped Macintosh computers begin shipping, software developers including Microsoft, WordPerfect, Adobe, Aldus and Claris will begin shipping new versions of their most popular software, specifically rewritten to take full advantage of the new processor's capabilities.

These optimized, sometimes called "native," applications will offer significantly faster performance than their MS-DOS, Windows or current Macintosh counterparts.

Unprecedented value.

Because RISC-based personal computers cost less to manufacture than equivalent systems based on CISC chips, we will be able to make this technology available for well under $2,500 for a complete mainstream desktop system*. Competitive with a lower-performance, Pentium-based PC.** Watch for Apple Report #3, coming soon.

Apple

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Circle 159 on reader service card

PowerCD to my Mac. Either I have a defective PowerCD or Mr. Heid didn't spend enough time with his PowerCD. The review also neglected to mention that the PowerCD will only operate for one hour on eight AA batteries.

I believe that Mr. Heid focused too much on how the drive looks and not enough on the PowerCD itself. The PowerCD deserves two stars.

Patrick Delahanty
Worcester, Massachusetts

To use the PowerCD remote control when the drive is connected to the Mac, start up the Mac with the PowerCD turned off. When the desktop appears, turn the PowerCD on. I don't have an answer for the second problem you describe—my PowerCD plays audio CDs perfectly when the Mac is switched off. Finally, you're right—my review should have pointed out that the PowerCD's battery life is about an hour. But I stand by the three stars: no other portable CD-ROM drive supports audio CDs and Photo CDs as well as the PowerCD—or is as cute.
—Jim Heid

Amazingly Expert Graphics

DARREL ANDERSON AND RICK Berry's graphics in the December 1993 *Expert Graphics* are amazing. The art itself indicates their exceptional talent and creativity, but what amazes me most is the tools they used to come up with such a rendition. I would imagine that a Mac II with 8MB of RAM, an 80MB hard drive, and a 13-inch Apple monitor with a $459 RasterOps card would only be good for word processing and Pac Man.

They're landing 1000-pound marlin with a 20-pound line. Someone give more power to Darrel and Rick—they must have time on their hands.

Antonio Dimalanta, Jr.
Tamuning, Guam

What Educator Discount?

THE LETTER BY TRACY ANNE SENA in the January 1994 *Macworld* concerning educators purchasing LC 520s for their friends triggered a thought. I contend that Apple's heavily discounted Educational Purchase Program is, in reality, dead. I ordered an LC 520 from my university bookstore the day it became available. Two weeks later I saw an advertisement in my local paper for the Performa 550. An extra $300 would get you 33MHz instead of 25MHz, a 160MB hard drive instead of 80MB, an internal fax modem, and $1300 worth of software, including ClarisWorks and the Grolier Encyclopedia.

When I saw this, I knew that Apple was no longer giving educators the traditional good deal. I have canceled my LC 520 order, and will now look toward the Performa 550.

Bernard Shapiro
Lowell, Massachusetts

Powerless before the Cool Factor

STEVEN LEVY'S COLUMN ON THE Newton made me cringe even though it was meant to be funny (*The Iconoclast*, January 1994). My husband read selected snippets aloud as he chortled through it. He seemed to think Levy had been watching me trying to use my Newton. My colleagues have already concluded that the Newton is not learning my handwriting, but training me to write to its standard.

My two-year-old has a toy called Doodle, which is slightly larger than my MessagePad. When I got one of the first Newtons in western Pennsylvania, my husband quickly christened it "Mommy's Doodle" and put one of the Newton stickers on the real Doodle. So why do I still love the thing and carry it everywhere, including to family gatherings and my daughter's play dates?

Is there a 12-step group for early adopters?

Linda Sue Boehmer
Clairton, Pennsylvania

Damning Copy Protection

ON THE STRENGTH OF YOUR GAME Hall of Fame recommendation (January 1994), I purchased a Lemmings game for a seven-year-old. Apparently, none of the programmers have children, or if they do, they spend little time with them. The copy protection and level codes are a miserable example of child and product interaction. Copy protection of this magnitude discourages and frustrates younger users and adults alike.

Daniel Kenny
Ventura, California

Letters should be sent to *Letters, Macworld*, 501 Second St., San Francisco, CA 94107; via fax, 415/442-0766; or electronically to CompuServe (70370,702), MCI Mail (294-8078), America Online (Macworld), or AppleLink (Macworld1), or via Internet (70370.702@compuserve.com). Include return address and daytime phone number. Due to the high volume of mail received, we can't respond personally to each letter. We reserve the right to edit all letters. All published letters become the property of *Macworld*. m

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Circle 47 on reader service card

Semi-pro.

HP ScanJet II CX

If you're a sophisticated scanner user, you shouldn't have to settle for a semi-sophisticated scanner. Not when the 1600 dpi EPSON 800C Pro/Mac has so much more to offer. More versatile controls. More powerful software. Better connections. Stronger support. More flexible options. All of which makes this the one scanner that will actually live up to your

*One-year warranty, extendable to two years with return of registration card, at no charge. EPSON, HP, Macintosh, Adobe Photoshop, and Kai's Power Tools are trademarks or registered trademarks of Seiko EPSON, Corp.; Hewlett Packard Co., Apple Computer, Inc., Adobe Systems and HSC Software respectively. All other trademarks are the property of their owners. ©1993 EPSON America, Inc., 20770 Madrona Ave., Torrance, CA 90503. For dealer referral or warranty details, call **800-BUY-EPSON** (800-289-3776). In Canada, call **(800) GO-EPSON**. For Latin America, **305-265-0092**.

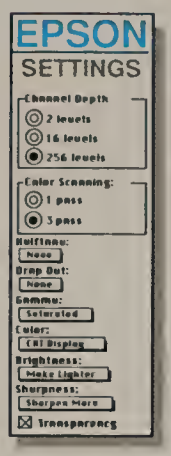
Pro.

The 800C Pro/Mac is solidly backed by EPSON's one-year warranty extendable to two years. HP's warranty is one year.*

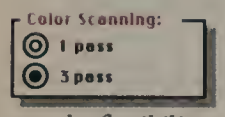
The 800C Pro/Mac comes with both SCSI and bidirectional parallel interfaces so you can connect it to a PC and a Mac simultaneously. The ScanJet II CX connects to one computer.

EPSON's transparency unit and document feeder are powerful options that work across every scanner in our line. HP's scanner options aren't that flexible.

The 800C Pro/Mac package includes the powerful full version of Adobe PhotoShop, plus the highly acclaimed Kai's Power Tools. HP offers a limited version of PhotoShop.



Only EPSON has color and gamma correction settings built right into the scanner hardware.



The 800C Pro/Mac gives you the flexibility of 1- or 3-pass scanning for optimal results with any image. The ScanJet II CX is strictly a 1-pass scanner.

If you need technical assistance, you can call the pros at the EPSON Connection, our toll-free help line.

EPSON 800C Pro
For Mac

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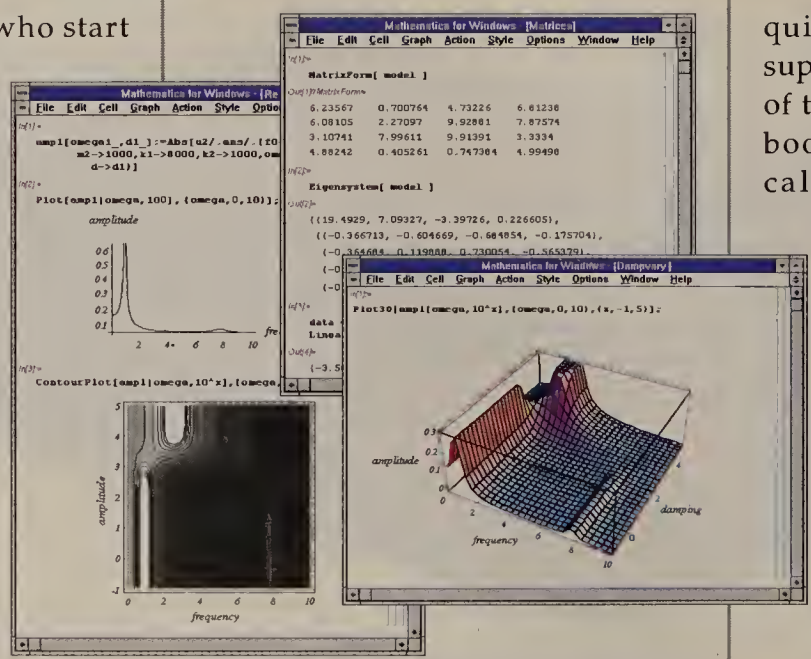
Engineers and scientists who start with other technical software programs soon reach a point they can't get past. The project isn't finished, but the software is. What can they do then but buy and learn yet another program for the next leg of the project, or return to pencil and paper to finish it out.

Fortunately, many engineers and scientists start with *Mathematica*. And they just keep going.



Only Mathematica notebooks enable users to create interactive documents combining text, live formulas, and graphics that can be modified within the document at any time and easily organized into a hierarchical outline.

Mathematica helps them past the standard calculations, and on to the more complex. Thousands of algorithms are at their fingertips to help them solve all kinds of technical problems. And nearly a hundred special-purpose packages are included free with *Mathematica* to take you even further. Add to that a revolutionary user interface, graphical abilities beyond comparison, and a symbolic programming language that makes it unprecedentedly easy to translate ideas into programs—and your possibilities are endless.

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LATE-BREAKING NEWS

MacBulletin

PowerPC Macs Will Run Windows Apple and Insignia Solutions have announced that some configurations of the PowerPC Macs will include Insignia's SoftWindows emulation software, which runs Microsoft Windows 3.1 and most Windows software packages (not those requiring 386 Enhanced mode) in a window on the Mac. Pricing, availability, and configurations were not disclosed at press time. Apple, 408/996-1010; Insignia Solutions, 415/694-7600.

Price Cuts, PowerPC Upgrades At press time, Apple announced price cuts ranging from 7 to 18 percent on the Quadra 650, 660AV, 800, 840AV, and 950, and offered $150 rebates to buyers of a Quadra 605 or 650 and certain Apple printers. The rebates end March 31. Apple also said it will offer PowerPC upgrades for the LC 475, 520, and 575; the Quadra 605; and the Performa 475, 476, and 500.

68060 Accelerators DayStar Digital plans to offer for current Macs a series of accelerators using the Motorola 68060 chip that Apple passed over in favor of the PowerPC 601. Expected in May, the 060 accelerators will give near-601 performance without requiring a move to native PowerPC software, DayStar says. Shipping will depend on availability of the 060 chip. Pricing will be competitive with DayStar's announced PowerPC upgrade cards. DayStar, 404/967-2077.

Adobe and Quark Tell PowerPC Plans At press time, Quark revealed plans to have a native PowerPC version of QuarkXPress 3.3 available by July. The software will be distributed on CD and include a collection of utilities, XTensions, and scripts. The PowerPC version will run 680X0 XTensions and any developed just for PowerPC. The price will be $995; that's $100 higher than the 680X0 version, which doesn't include the extra software. Separately, Adobe Systems said that within a few weeks of the introduction of the PowerPC Macs, it will offer a set of Photoshop filters that run as native PowerPC code. The filters will be available on online services or can be ordered directly from Adobe for $10. Quark, 303/894-8888; Adobe, 415/961-4400.

Color Ink-Jet Printer The Apple Color StyleWriter Pro is a 360-dpi ink-jet printer that produces up to 2 pages per minute in monochrome, or 1 page every 2 minutes in color. It includes 64 TrueType fonts, Apple's ColorShare driver for printer sharing, ColorSync color-matching software, and a 100-sheet paper feeder that can feed envelopes. The Color StyleWriter Pro can print on letter- and legal-size plain paper and on transparencies. The QuickDraw printer should ship in late March at a direct price between $649 and $749.

Apple to License the Mac OS Michael Spindler, president and CEO of Apple, said the company intends to license the Mac Operating System to computer makers who will use the PowerPC chip. Apple said personal computer vendors showed more interest in doing PowerPC-based systems than Intel-based systems with a version of the Mac OS. Apple has several times said it was considering licensing the Mac OS.

Revenues Up, Profits Down Apple announced that revenues for its first fiscal quarter of 1994 reached $2.469 billion—up 23 percent over the same quarter a year ago. However, net income for the quarter fell to $40 million, down from $161.3 million last year; and gross margins were at 24 percent, down from 40.5 percent a year ago. Unit sales rose to over 1 million in a single quarter, a record for the Macintosh. Apple shipped 2.086 million personal computers in the United States in 1993, the most by any vendor last year, according to Dataquest, a market-research firm based in San Jose, California. m

News

EDITED BY TOM MORAN

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Apple Ships First All-in-One 040 LC

Apple Computer has brought the power of the 68040 microprocessor to an all-in-one Macintosh for the first time, in the LC 575. The latest incarnation of Apple's low-end line looks just like an LC 520, but offers performance similar to that of the Quadra 800 at a price well under $2000, complete with internal CD-ROM drive. There's also a brand-new way to add more to the machine.

The LC 575 lives in the same all-in-one box that holds the Performa 550, the LC 520, and the Mac TV. But pop off the back panel, and the motherboard pulls out like a cookie sheet. A big 33MHz 68LC040 CPU dominates the 32-bit bus landscape, complemented by 4MB of RAM (expandable to 36MB), 1MB of VRAM, and an LC-PDS slot. (See the benchmarks on page 38.)

PHOTOGRAPH BY ROBERT PERRY. SCREEN IMAGE BY DIANE FENSTER/JIM SUGAR.

With a 33MHz 68LC040 microprocessor, Apple's Macintosh LC 575 is the fastest all-in-one Mac ever (see the benchmarks, "How Fast Are the LC 550 and 575?" on page 38).

So far, the worst thing you can say about the LC 575 is that at first it won't be available through consumer channels. Don't pull out your old school bag just yet, though. Apple has said that consumer versions of both the 575 and the LC 550 (see below) will appear later this year; the timing will depend on the needs of consumer-channel resellers. Until then, dealers may have to keep a sharp eye out for middle-aged "high-school students" looking for a low-cost Mac with a big punch.

You can never be too rich or have too many expansion slots, so Apple designed a new one and tucked it into the LC 575, right next to the PDS. The Communications Slot is similar in design to the PDS. Initially, Apple will offer Ethernet cards in three flavors (10BaseT, thin Ethernet, and AAUI) for $84 each, and a $149, 14.4-Kbps fax modem based on the PowerBook Express design. Apple is talking to third-party developers about other possible board designs that would fit into the 2-by-6-inch slot. By the time you get to the accoutrements, you'd think the surprises

would be over. Indeed, the LC 575's monitor is Apple's standard 14-inch Trinitron display, and the floppy drive is the standard 1.44MB SuperDrive. But the internal, double-speed (AppleCD 300i–equivalent) CD-ROM drive sticks out a tray for the disc. That means no more disc caddies, and Apple even included an eject button.

ROBERT PERRY

The logic board of the LC 575 includes a new communications slot (on upper right).

In the tale of the tape, the LC 575 compares favorably—users will be putting Quadra 800 power on their desktops for a fraction of the cost, as our preliminary benchmarks show. And if that just isn't enough power for you, Apple has stated that the LC 575 will accept a PowerPC upgrade, for which the company is currently considering both the 601 and 603 versions of the RISC chip.

The machine does have minor drawbacks; a single DRAM expansion slot means users who want a lot of RAM will have to buy expensive, single-board SIMM upgrades. Also, the 68LC040 CPU lacks a math coprocessor. Other difficulties could surface in the Comm Slot modem; its Express Modem architecture wasn't Apple's most reliable technology when it first appeared in PowerBooks. However, Apple claims that not having to deal with PowerBook sleep cycles and battery-power management has cleared up most of the problems, and that hard work on the software side has eliminated the rest.

Educators can walk away with the 5/160/CD package, complete with keyboard and mouse, for a cool $1699. An 8MB configuration is also available to volume buyers. That kind of pricing on a complete, compact 040 system makes the LC 575 extremely attractive to a wide range of markets. It's got the horsepower to wade through high-powered business software and cycle-hungry multimedia, and it's moderately expandable. It's small enough to fit easily on an office, classroom, or home desk; it's portable; and when it comes time for setup or takedown, there's one cord and one power switch.

Going for speed increases across the board, Apple also replaced the LC 520's 25MHz 68030 CPU with a 33MHz version. They call the new model the LC 550, and it will replace the LC 520. The LC 550 ships for $1199 with keyboard, mouse, 4MB of RAM, and a 160MB hard drive; and it's upgradable to the new tray-loading CD-ROM drive. Like the LC 575, the 550 is PowerPC upgradable, and an 8MB version will be available to volume buyers.

—CAMERON CROTTY

Apple Video/ Media Bundles

SOLUTIONS FOR CONTENT DEVELOPERS

Some assembly required. Three words that strike fear into the hearts of consumers everywhere, especially professional Macophiles. Even if all the pieces of a system exist, getting them in one place and working together properly can be a nightmare. Enter the Apple Professional Video Production Solution and the Apple Media Authoring Solution. These bundles contain all the hardware and software necessary to edit and produce digital video and CD-ROM–style multimedia, respectively.

After handing over $10,749 for the Video Production Solution, video producers get a system (not including CPU, monitor, and keyboard) that's based around Radius's 60-fields-per-second VideoVision Studio product. The bundle also includes a 2GB MacinStor hard disk drive by Storage Dimensions, Digidesign's Audiomedia II card, and a pair of AppleDesign Powered Speakers. Purchasers also get the Adobe Premiere Deluxe CD-ROM edition, and VideoFusion video-editing software. For underlying hardware, Apple recommends using a Quadra 800, 840AV, or 950 with 32MB of RAM, a 1GB internal hard disk drive, and an AppleCD 300i CD-ROM drive.

An appropriately decked-out system will produce video results that will be suitable for corporate sales, promotion or training, and education, according to Apple. Professional video producers will mostly find the system useful only for drafting or prototyping ideas; however, if a video has a multitude of short, quick cuts and busy images, Apple's bundled video-production system could be used for final output to tape, according to the company.

The Media Authoring Solution is aimed at multimedia developers creating presentations and CD-ROM content. For $6999 (direct price), purchasers get SuperMac's DigitalFilm and ThunderStorm cards, a set of AppleDesign speakers, plus a slew of software including Adobe Premiere and Photoshop Deluxe CD-ROM editions; CoSA After Effects; Kodak Shoebox; Macromedia Director, Action, and MacroModel; and the Apple Media Tool. Apple again recommends using a Quadra 800, 840AV, or 950.

The company also recommends the Sony CDW-900E

continues

In Brief

Quadra 605 VRAM Upgrade Problems

Having trouble upgrading the VRAM on your Quadra 605? The data sheet for the 605 lists the wrong part number for the VRAM SIMM upgrade, M05017LL/A. The correct kit is M1311LL/A, which is also used for the Macintosh Duo Dock. Apple says that dealers will be informed of the mistake, and the data sheet will be changed.

Don't Fry Your Fax Modem

If you connect your Global Village modem or fax modem to the digital phone lines (for example, PBX installations) found in many offices and hotels, you run the risk of seriously damaging the hardware. The solution is the company's $149 GlobalSwitch, a bit of hardware that lets you plug your modem into the handset jack of a telephone and get the analog output your modem needs. 415/390-8200.

Kills Germs Fast!

DataWatch is claiming that Virex 5.0 runs many times faster than previous versions of Virex or any other virus software. For example, the company claims the antivirus utility can search an 80MB hard drive in ten seconds and causes no noticeable delay when searching applications as they launch. Virex 5.0 lists for $99.95. 919/549-0711.

StuffIt for PowerPC

Aladdin Systems has announced that it will ship native PowerPC versions of its StuffIt series of software for compression, archiving, translation, and security. Aladdin said that native PowerPC versions of StuffIt Deluxe, StuffIt SpaceSaver, and StuffIt Lite will appear in the first half of 1994. Aladdin is also working on a native PowerPC version of StuffIt InstallerMaker, which helps software developers make custom installers. 408/761-6200.

MW LAB How Fast Are the LC 550 and 575?

CORE-PERFORMANCE INDEX

Times as fast as a Classic (Classic = 1.0).

Use these standard ratings of overall performance, based on a core test suite, to compare systems across classes.

BUSINESS-SYSTEM PERFORMANCE TIMES

Times are in seconds. Shorter bars are better.

Use these results to compare the performance of systems for different types of real-world business tasks. The results can be compared with any other *Macworld* Business-System Performance Times.

Best result in test. Products are arranged in decreasing order of overall performance.

Common — Typical business tasks in Microsoft Excel and Word that use the Mac's processor, drives, and video display.

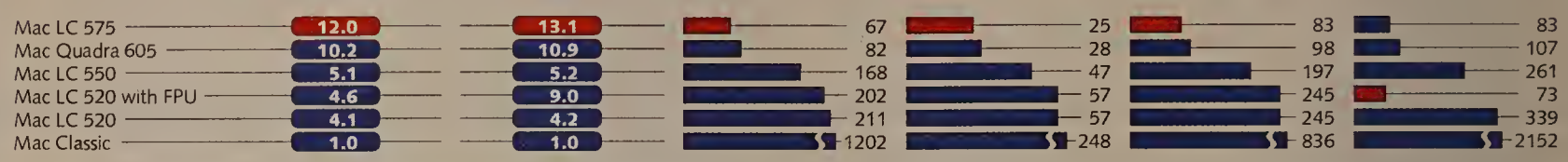
Scientific — We added to the common tasks several scientific calculations (which use floating-point math).

Processor — Several tasks in Adobe Photoshop, Aldus FreeHand, Microsoft Excel and Word, Claris FileMaker Pro, and QuarkXPress.

Drive-Access — File-opens in Adobe Photoshop and Microsoft Excel and Word, and disk-based sorts in Claris FileMaker Pro.

Video-Display — Vertical scrolling in Microsoft Excel and Word, and QuarkXPress.

Floating-Point — Scientific recalculations (which use floating-point math) in Microsoft Excel.



Write Once drive for mastering your own CDs, but the unit is not included in the direct price, nor are the required CPU, monitor, and keyboard.

Going to your local Apple dealer and getting all this stuff in one box sounds like a dream come true for computer-phobic video-content developers. But the real magic, according to Apple, is that this mix of hardware and software will work together. If it doesn't, all you have to do is get on the horn to Apple during business hours (800/767-2775). According to the company, if its in-house support techs can't handle the problem themselves, customers will be forwarded directly to the appropriate company—no hanging up and no redialing.
—CAMERON CROTTY

PAUL BERG

AppleDesign Powered Speakers, 2GB MacinStor SpeedArray drive, and VideoVision Studio board.

Faster 040s

DOUBLE YOUR CLOCK RATE

At Macworld Expo in January, Newer Technology introduced a line of clock-doubler accelerators for Centrises and Quadras. Called Quadra Overdrive, the accelerators consist of small boards that fit into the 040 socket on a Quadra or Centris motherboard after the Mac's original 040 has been removed. The boards have their own 040 chips that run at double the clock rate of the removed processor, even though the speed of operations on the motherboard remains the same. In this kind of arrangement, processor-intensive applications speed up significantly; I/O-intensive applications, however, benefit less.

The accelerator line will include models that double the processor speed of a 20MHz 040-based Mac to 40MHz (Centris 610 only), and of a 25MHz Mac to 50MHz. The 50MHz board also works with a 33MHz Mac motherboard. Motorola does not currently offer a 50MHz 68040, but a Newer representative said the company is taking advantage of Motorola's conservative speed ratings, and that Newer tests all the boards before shipping them. The Quadra Overdrives come with a chip-puller so that users can install the board themselves if they so desire. The list price is $1700 for either model, both of which were slated to ship at the end of January. Newer Technology, 316/685-4904.—T.M.

Files at a Glance

POP GOES THE FOLDER

Double-clicking your way through a tree of folders can be just plain irritating. You might want to give the quick-twitch muscles in your index finger a rest by using Inline Design's PopupFolder, which is the first commercial product that opens menus of files directly from Finder icons. After you install this control panel, a tiny black triangle appears on all desktop folders. When you click and hold on a folder, a hierarchical menu pops up, displaying what's inside that folder. Got more than one layer? Just drag your cursor over the name of the subfolder, and *its* contents appear in a submenu.

PopupFolder can drill down through five sublevels, and you can configure the font used in the menu, set a different font for aliases and subfolders, as well as have subfolders appear at the top of the menu list. As if that weren't cool enough, the pop-up menus also appear inside Open and Save file dialog boxes from both the file list and the header, as well as from the Apple menu. PopupFolder is currently available for $59.95. Inline Design, 203/435-4995.
—CAMERON CROTTY

Inline Design's PopupFolder lets you open menus of files by clicking on Finder icons.

Video Capture, Compression

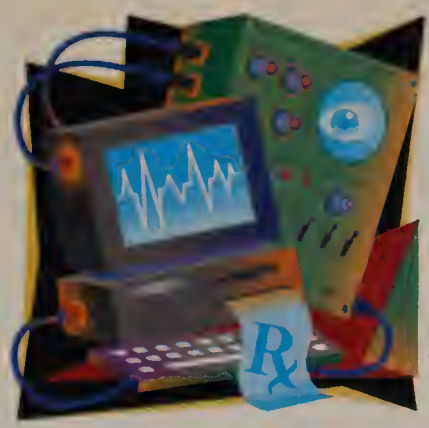
REAMS OF FIELDS

Addressing the demands of video-editing professionals, SuperMac Technology has begun shipping DigitalFilm 1.5, a NuBus board that captures and plays back video at 60 fields per second. Previous versions of DigitalFilm

captured only 30 fps, ignoring one of the two interlaced fields in each frame of full-motion analog video. SuperMac says capturing both fields per frame yields better smoothness and quality.

The $3999 DigitalFilm 1.5 package includes Adobe Premiere 3.0, CoSA After Effects 1.1, Macromedia Director 3.1, Diaquest DQ-TimeCoder, and Alsoft DiskExpress. A free user-installable upgrade to version 1.5 will be mailed to all current owners of DigitalFilm.

SuperMac also announced the Cinepak Compression Accelerator Kit. The $1499 kit's two ThunderStorm DSP boards and Cinepak DSP software cut by up to 66 percent the time CD-ROM developers must wait for digital video to compress into Cinepak format. The software, which requires ThunderStorm hardware, sells separately for $499. SuperMac, 408/541-6100.
—JIM FEELEY


HANK OSUNA

Diagnose Your Mac

UTILITY TESTS HARDWARE AND SOFTWARE

Intended to help users monitor the health of their Macintoshes, Apple Personal Diagnostics is a suite of utilities that tracks system performance and aids in maintenance and troubleshooting. The product can test the motherboard, RAM, drives, and displays, and, according to Apple, tell you what's wrong and how it can be fixed (the program sometimes advises you to seek out a specialist). Users can choose to have the program test the Macintosh's performance automatically during times when the system is not busy. The utility can keep a log of system performance over time, so you can see if adding a peripheral (or some other change) has caused a problem. Apple expected to begin offering the program in March through Apple dealers and software resellers. The direct price is expected to be $129. Apple Computer, 408/996-1010.—T.M.

VidJet Pro: Print from Video

TO HP PRINTERS

The creative thinkers at Hewlett-Packard have introduced the HP VidJet Pro, a box that connects a printer to both a TV and VCR and lets most HP printers output color TV images, be they black-and-white or living color. The VidJet Pro doesn't require a Mac or another computer to operate; it works as a hard-copy adjunct to a personal computer–based professional video-editing system. The device accepts input from any video source and can print to HP DeskJets or LaserJets or to the HP DesignJet series of plotters. Applications include storyboarding, indexing, and logging videotapes by SMPTE time code. The VidJet Pro starts at $3500 and is currently shipping. Hewlett-Packard, 800/367-4788.—T.M.

SCOTT PETERSON

HP's VidJet Pro lets you print images from a TV or VCR.

BUGS & TURKEYS

Music Shop 1.0—and your Mac—come to a crashing halt if you try to edit notes in the New Notation window. Registered users can get the fix for free by requesting the 1.01 upgrade from Opcode Systems.

Aldus FreeHand 4.0 users have reported occasional problems with text shifting when converting FreeHand 3.X documents. Aldus says it is aware of the problem but cannot offer a solution.

A bug in Meeting Maker prevents users from reassigning conference rooms after they've been booked and then unbooked; once the room is scheduled, the time slot is blocked off. This occurs only with conference rooms that are scheduled on a first-come-first-served basis. On Technology says an upgrade should be available by the middle of February.

WordPerfect lets you exchange files with Windows users, but only if you're patient. The company shipped WordPerfect 3.0 for Macintosh in early October but didn't have conversion filters for WordPerfect 6.0 for Windows until almost two months after the Windows version shipped.

Macworld will send you a Bug Report T-shirt if you are the first to inform us of a serious, reproducible bug that we report in this column, or a Turkey Shoot T-Shirt if we shoot your turkey in this space. See *How to Contact Macworld*.

In Brief

Microtek Drops Scanner Prices

Microtek Labs has cut prices of its ScanMaker II, ScanMaker IIXE, and MS-II scanners. The 24-bit color ScanMaker II went from a range of $900 to $1000 to a range of $649 to $699, including Photoshop 2.5 LE. The IIXE's price went from a range of $1149 to $1249 down to a range of $1049 to $1099. The IIXE includes the full version of Photoshop 2.5. The MS-II sheet-feeding scanner's retail price fell from $1195 to $849. 310/297-5000.

Speedy LC Accelerator

The DiiMOCache 50MHz LC and DiiMOCache 50MHz LCIII accelerators feature 68030 chips with 64K caches. The LC version supports the LC, LC II, and Performas 400, 405, 410, and 430. The LCIII supports the LC III and the Performa 450. Both ship for $649 ($749 with math coprocessor) from DiiMO Technologies. 512/218-9400.

Proactive Time Management

First Things First Proactive, the new version of Visionary Software's time-management program, helps you define and prioritize goals, making it easier to organize your work and schedule time. First Things First's base view is an outliner rather than a calendar, allowing you to focus on projects rather than dates. Available from Visionary Software for $149. 503/246-6200.

DayStar Value 040

The Value 040 line of accelerators puts a 68040 in a Mac LC, LC II, Performa 400, 405, 410, or 430. Both LC040 and full 040 versions are available at 30MHz, as is a 40MHz full 040. All cards have a 128K cache; users can add an Ethernet module with an AAUI interface ($219). Prices run from $899 to $1299, from DayStar Digital. 404/967-2077.

QuickTime Effects

PLUG-IN PREMIERE FILTERS

Just when you thought it was safe to go back into QuickTime, Gryphon's Dynamic Effects adds a whole slew of special effects to Adobe Premiere. The 20 plug-in modules in Volume I range from the mundane to the quirky. Smooth Wipe and Smooth Round Iris soften the edges of traditional transitions, while Tempus delays user-defined portions of an image—moving objects seem to stretch, bend, or dissolve and reform.

Gryphon Software's Dynamic Effects offers 20 plug-in filters for Adobe Premiere.

The Dynamic Effects filters give you several ways to play with color channels: one filter delays an entire color channel, another copies one channel to another, and a third assigns colors based on an image's luminance. Other effects in the package include dynamic brightness and contrast, soft focus, and a series of four filters that, when used together, "age" a movie by simulating yellowed, dusty, black-and-white celluloid film running on a movie projector with a flickering lamp and damaged sprockets. Dynamic Effects, Volume I, is currently available for $119. Gryphon Software, 619/536-8932.
—CAMERON CROTTY

TREND

HyperCard + AppleScript = OpenDoc?

DO-IT-YOURSELF DEVELOPMENT

HyperCard, the original do-it-yourself software-construction set, and AppleScript, the latest one, have been updated and now work together. The combination moves toward Apple's OpenDoc document-centered computing metaphor.

The AppleScript Scripter's Toolkit features the AppleScript 1.1 system extension. Buyers also get version 1.1 of the Script Editor, which now lets programmers watch scripts execute line-by-line. This isn't a complete debugger, but Apple promises more robust programming tools. The kit includes GUI-design software; Software Designs' Frontmost Interface Processor can handle nine projects at once. Users can make complete interfaces ranging from windows and dialog boxes to buttons, menus, and text. Apple said over 80 developers support AppleScript, including ACI US, Aldus, Great Plains, Microsoft, Quark, Symantec, and WordPerfect. The $189 Scripter's Toolkit is shipping.

Apple has resurrected HyperCard, and in living color. Users can put QuickTime movies in stacks and, with Motion Works' Addmotion II (included), add animations to stacks. Projects can finally be saved as stand-alone applications. HyperCard 2.2 is fully OSA and AppleScript compatible, and it's available for $249.

Why take HyperCard back from Claris and revive it? The answer lies in Apple's cross-platform vision of document-based computing—OpenDoc. Under OpenDoc, users will view projects as documents consisting of several parts—a text letter, for instance, with a spreadsheet and a graphic chart embedded in it. Each part is controlled by a part editor that provides tools for manipulating content. Apple is seeding developers with an early release of OpenDoc, but with the new HyperCard and the new AppleScript, Apple already has a working version of a document-based environment. Stacks can use AppleScript to call on applications to perform a wide range of tasks—all from within HyperCard. OpenDoc is due in mid-1994. Apple Computer, 408/996-1010.—CAMERON CROTTY

THE AMCOEX INDEX OF USED MAC PRICES

Machine/RAM/Hard Drive	Average Sale Price	Monthly Change
PowerBook 100/4MB/20MB	$725	+$25
PowerBook 140/4MB/40MB	$950	–$25
PowerBook 180/4MB/80MB	$1600	–$150
PowerBook Duo 230/4MB/80MB	$1150	–$100
Mac Classic/2MB/40MB	$450	–$25
Mac SE/30/2MB/40MB	$650	–$50
Mac LC II/4MB/40MB	$500	–$50
Mac IIsi/3MB/40MB	$550	–$50
Mac IIci/4MB/80MB	$850	–$50
Mac IIfx/4MB/80MB	$900	–$75
Centris 650/8MB/230MB	$1500	–$200
Quadra 900/8MB/160MB	$2500	–$100

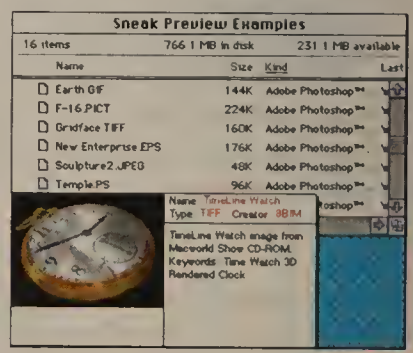
Index provided by the American Computer Exchange of Atlanta, Georgia (800/786-0717). It reflects sales during week of January 20. Configurations include keyboard and exclude monitor and display board for noncompact models.

Sneak a Peek at Finder Files

PREVIEW UNOPENED FILES

Logical Solutions' Sneak Preview is the first software program that turns a folder of anonymous documents into a quickly searchable resource at the Finder level. When you hold down a configurable hot key while pointing at a document in the Finder, the software automatically pops up a 128-by-128-pixel preview image. Previews move with documents from Mac to Mac, and you can either create them by dragging and dropping selected documents, or you can have the software automatically add them as you work.

The Sneak Preview package as it ships understands TIFF, PICT, EPS, JPEG, GIF, QuickTime, and text files; you can add other formats as necessary through optional plug-in translators. There is also a 256-character description field that's used for file notes that won't disappear when you rebuild your desktop. Sneak Preview is currently available for $129.95. Logical Solutions, 612/659-2495.—CAMERON CROTTY



With Logical Solutions' Sneak Preview, you can view an image of a file without opening it.

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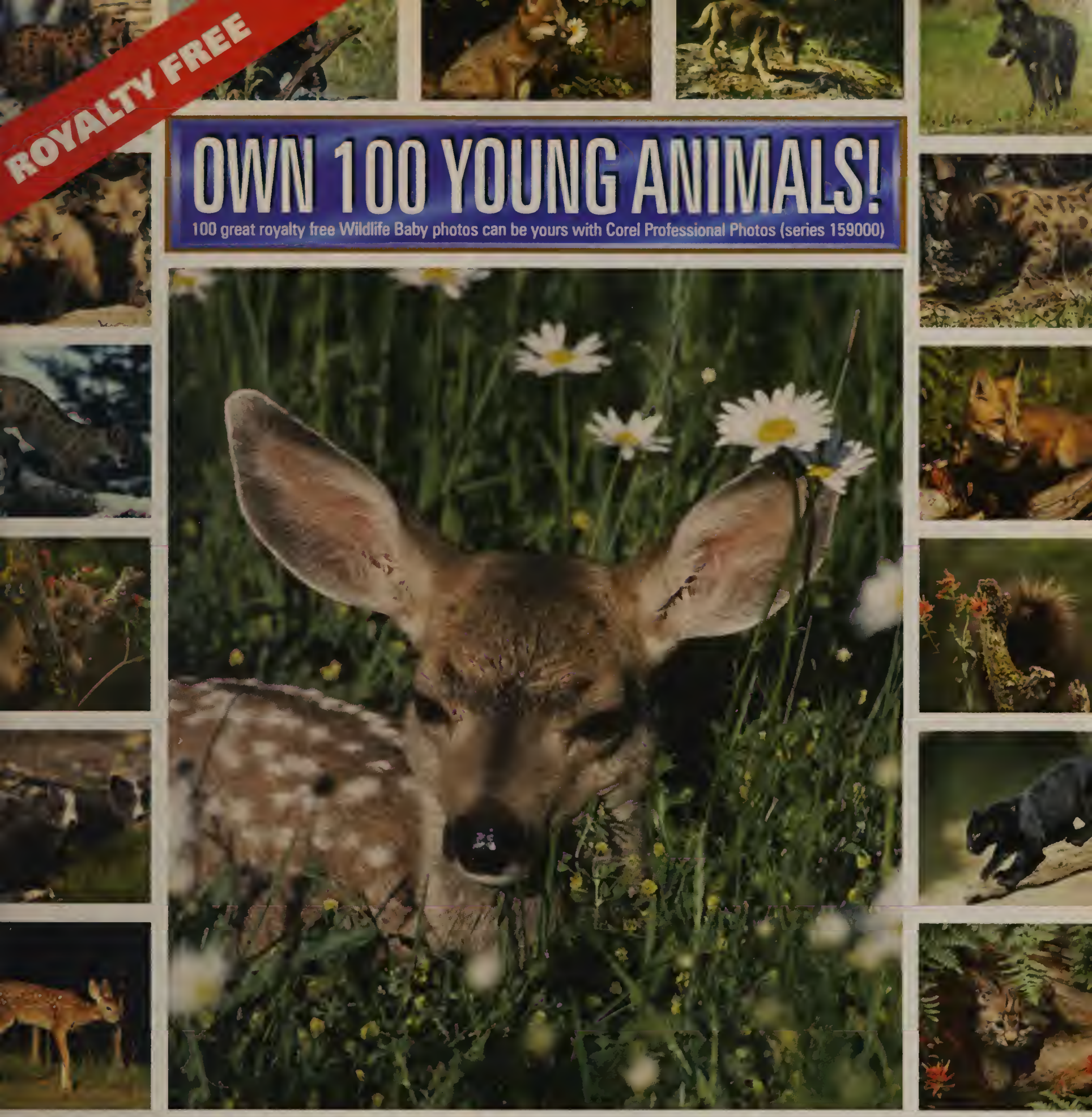

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Circle 78 on reader service card

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DayStar's complete line of '030, '040 and PowerPC upgrades will boost your Mac to new heights.

Get More Speed Now and Upgrade to PowerPC for $199!

PowerPC is just around the corner. But, you don't have to wait to go faster with DayStar's new $199 PowerPC Upgrade Program. Just buy one of DayStar's '040 accelerators before March 31st and revel in your new productivity. Then, this summer, when you're ready, make the jump to PowerPC for only $199†.

DayStar's PowerPC upgrade card will make you fly!

The PowerPro 601 delivers the absolute maximum in PowerPC performance—66 MHz and blazing 80 MHz speeds*. Later this year, look for 100 MHz speeds! The PowerPro 601 uses the new Apple® PowerPC ROMs for 100% compatibility. Just plug it right into your Mac. Check out its memory expansion and cache. But...

Get a jump on productivity with proven '040 technology today!

At superfast 40 MHz speeds, the Quad 040 and Turbo 040 boost you to speeds matching Apple's current fastest—the Quadra 840AV. *MacUser* magazine recently stated, "The Turbo 040 is the best accelerator family for the Mac SE/30 and Mac II family." And, MacWEEK awarded it their prestigious "five diamond" rating.

The smart decision... Upgrade to the DayStar '040 now!

You can always upgrade DayStar products to the latest technology. We have several upgrade programs for everybody from DayStar PowerCache customers to owners of our competitor's products. You'll even be able to upgrade your PowerPro 601!

So, leap as high as you want! The lowest cost way to PowerPC is to buy a DayStar '040 accelerator before March 31, 1994. Then, you can jump to PowerPC for just $199! DayStar provides you with a carefree way to get impressive speed today and security for tomorrow.

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Circle 7 on reader service card

†DayStar has several ways for you to upgrade your Macintosh to faster performance, including DayStar's $199 PowerPC Upgrade Promotion. Call for details. Some restrictions may apply. *The PowerPro 601 processor upgrade will ship concurrently with Apple's delivery of its PowerPC products. DayStar is a registered trademark of DayStar Digital, Inc. Other brands and product names are trademarks or registered trademarks of their respective holders. Product specifications are subject to change without notice. ©1994 DayStar Digital, Inc.

PowerPC News

Vendors Push Publishing

EUROPEANS TAKE LEAD

Developer enthusiasm for Apple's new platform isn't limited to America's shores; vendors on the other side of the Atlantic have also announced native applications aimed at specialty publishing.

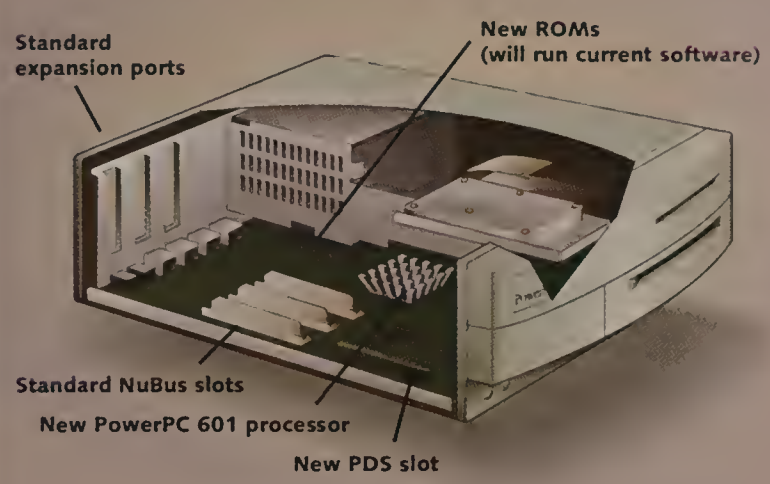
ArtPro, from Artwork Systems N.V. in Belgium, is a high-end application for prepress production of labels and packaging. Users can manipulate complex line art, edit PostScript files, and optimize PostScript output. A typical ArtPro installation costs around $30,000.

From Germany, IsoDraw is Itedo Software's 2-D graphics application for technical illustration. Intended for large, complex projects, the package will retail for $2700.

Itedo also figures in an effort to make high-end technical publishing available on the Mac. Frame Technology, Itedo, and Canto Software have worked together to create a technical-publishing system that uses FrameMaker 4.0 as the publishing engine, IsoDraw as the technical-illustration engine, and Canto's Cumulus as the image-database engine. According to the companies, all three of these products will be available when Apple rolls out the PowerPC hardware. Artwork Systems, 011-32-9-225-79-46; Process Automation (Itedo's American distributor), 313/668-6611; Frame Technology, 408/433-3311; Canto Software, 415/431-6871.

—CAMERON CROTTY

What's New and What's Not



The forthcoming PowerPC Macs will offer strong backward compatibility with existing Mac hardware and software. This conceptual drawing of a PowerPC Mac is based on Apple statements.

PowerPC Apps

MORE NATIVE SOFTWARE

As Apple nears the due date for the PowerPC Macs, more and more native applications are appearing on the horizon.

• Aladdin Systems will release StuffIt Deluxe, StuffIt SpaceSaver, and StuffIt Lite, in which compression should be much faster.

• Dayna Communications will have its new $129 ProFiles utility for file synchronization, background copying, and logical grouping of files (no matter where on a disk or network they reside) to the Mac Finder.

• Great Plains Software plans to release Dynamics 2.0 and Dynamics C/S+ accounting modules this spring.

• Gryphon Software Corporation will release Morph 2.5 as a fat-binary program, so it can be used on either a PowerPC Mac or a current 680X0 Mac. The morphing should run at least twice as fast as it does now.

• Ray Dream said it plans to ship Ray Dream Designer, a 3-D illustration package, by July.

• Macromedia expects to have MacroModel 1.5 available at the PowerPC Macs' release. Upgrades to the $1495 program will be $49 from MacroModel 1.5 and $149 from earlier versions.

• Graphisoft US will give users of its $4950 ArchiCAD architectural-modeling software free upgrades. Graphisoft will offer a $500 rebate to new customers who buy a PowerPC Mac.

At press time, upgrade pricing was not set for some products mentioned. Aladdin, 408/761-6200; Dayna Communications, 801/269-7394; Great Plains, 701/281-0550; Gryphon Software, 619/536-8815; Ray Dream, 415/960-0758; Macromedia, 415/252-2000; Graphisoft, 415/737-8665.—GALEN GRUMAN

GraphIsoft ArchiCAD

Upgrades for Video Cards

COMPATIBILITY PROMISED

SuperMac Technology and Radius will offer software and ROM updates so their NuBus-based cards will be fully compatible with the PowerPC Macs. (Without updates, the cards will run unaccelerated without some features.) The software updates will let the cards use the PowerPC Macs' faster native QuickDraw. The ROMs will let the cards access new video capabilities in PowerPC Macs, such as on-the-fly resolution switching, the companies said.

SuperMac will offer free software and ROM upgrades for its PhotoSpeed, Spectrum/24 PDQ Plus, Spectrum/24 Series IV, Spectrum Power 1152, and Thunder series. To upgrade, call SuperMac at 800/541-7680.

Radius will post free software updates online. Radius will sell upgrade kits with new ROMs and software at cost for the Color Pivot and PrecisionColor series of cards. Radius, 408/434-1010.

The companies plan to ship the updates around when the first PowerPC Macs ship.

—GALEN GRUMAN

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Quality Assurance Guarantee - To protect your investment, Xante provides a one year warranty and full customer support on all our products. Compare, then call us.

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Optional Resolution (dpi)	800 x 800, 960 x 960 & 1200 x 1200	None	600 x 1200	None
Standard RAM	12 MB	12 MB	12 MB	16 MB
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Enhanced Gray Scale	✓			
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† Optional

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Circle 1 on reader service card

New Products

THE LATEST MACINTOSH RELEASES

by Cameron Crotty

THIS SECTION COVERS MACINTOSH PRODUCTS FORMALLY ANNOUNCED BUT NOT YET EVALUATED BY *MACWORLD*. UNLESS OTHERWISE STATED, THE MINIMUM REQUIREMENTS FOR OPERATION ARE A MAC PLUS, WITH 1MB OF RAM, RUNNING SYSTEM 6. ALL INFORMATION AND PERFORMANCE CLAIMS ARE SUPPLIED BY THE PRODUCT VENDOR AND HAVE NOT BEEN INDEPENDENTLY VERIFIED BY *MACWORLD*. ALL PRICES ARE SUGGESTED RETAIL. PLEASE CALL VENDORS FOR INFORMATION ON AVAILABILITY.

HARDWARE

AutoClock+

We may be in the computer era, but punching a time clock hasn't changed since around 6 B.C. This package bundles United Bar Code Industries MagScan magnetic strip and badge reader with 20 badges and DataDesigns AutoClock time-card software. Each time an employee swipes a card through the reader, the software automatically records the "in" and "out" times. At the end of the pay period, management can print time sheets for each employee, as well as summary reports. The software also handles payroll services, including deductions and benefits. 2.5MB min. memory. $1095. DataDesigns, 210/697-0780; no fax.

Desktop Projectors

If you need to give large presentations, but you can't count on an overhead projector or you find LCD panels too dim, this line of desktop projection systems might fit the bill. The 2300 uses a passive matrix color LCD and can display up to 24,389 colors. The 2700 and 2800 both feature active matrix LCDs capable of displaying 2 million colors simultaneously from a palette of 16.7 million. The DP 2800 also accepts composite and S-Video input and has stereo speakers. On all models, the lens-mirror assembly folds down for protection during transport or storage. DP2300 $4995; DP2700 $7995; DP2800 $8995. Proxima Corp., 619/457-5500, 800/447-7694; fax 619/457-9647.

Desktop Projectors

Dispatcher Pocket Modem

At 2.25 inches wide, 4.25 inches long, and less than 1 inch deep, this 14.4/14.4-Kbps fax modem won't take up much space in your briefcase. The modem features MNP Classes 2 through 5 and 10 (cellular error correction) and is compliant with all CCITT standards up to V.42bis. The fax is V.17-, and Group III–compliant, and the product is bundled with STF's Faxstf and Software Ventures' Microphone LC. A 2400-bps/9600-bps version is also available. $335; 24/96 $122. Piiceon, 408/432-8030, 800/366-2983; fax 408/943-1309.

Dispatcher Pocket Modem

Emotia

Converting video is not as difficult as it used to be, but you still need special equipment. This external box converts standard Macintosh 640-by-480-pixel video to a composite (NTSC, PAL), S-Video, or RGB analog signal. The unit includes freeze-frame and underscan/overscan switches, plus horizontal and vertical centering and horizontal-width controls. $1495. Extron Electronics, 310/802-8804, 800/633-9876; fax 310/802-2741.

FlexCam/Document

A color video camera for desktop document imaging. The unit sends out 510-by-492-pixel composite (NTSC, PAL) or component (S-Video) video. The camera is mounted on an 18-inch flexible gooseneck wand, supported by a 2-pound base. The lens's focal length ranges from .25-inch to infinity, and the lens can operate in light conditions as low as 2.5 lux. A version with stereo microphones integrated into the camera head is also available. $995; with microphones $1045. VideoLabs, 612/897-1995; fax 612/897-3597.

FlexCam/Document

Goldstar 1515, 1520, and 1725

These multisync color monitors feature digital controls with seven factory presets and space for five groups of user-defined settings. The 1515 and the 1520 are 15-inch displays that support resolutions of up to 1024 by 768 at 70Hz to 76Hz vertical refresh rates. (The 1520 also has higher noninterlaced resolutions available than the 1515.) The 1725 is a 17-inch monitor that goes up to 1280 by 1024 pixels at 70Hz to 76Hz vertical refresh rates. All three monitors are Energy Star– and MPR II–compliant and work on Mac II and LC internal video—the 1725 also supports Quadra video. 1515 $579.95; 1520 $629.95; 1725 $1099.95. Goldstar Technology, 201/816-2000; fax 201/816-2188.

HammerPE Line

This series of drives might give you the space you need without creating an equal-size space in your wallet. SyQuest-based removable-cartridge drives (average seek times of 14.5ms to 20ms), magneto-optical drives (an average seek time of 30ms), and standard hard drives (average seek times of 12ms to 17ms) are available in both internal and external configurations. External systems come in a metal chassis, and all drives ship with the company's Hard Disk ToolKit Personal Edition SCSI utility software. Pricing ranges from $529 for a 170MB external hard drive to $1379 for an external 128MB magneto-optical drive. FWB, 415/474-8055; fax 415/775-2125.

Mirror 1200 Color Scanner

1200 by 600 dots of true resolution means that this 24-bit flatbed color scanner can make out even the tiny automobiles in your prize-winning photograph of the earth, taken while in free fall at 5000 feet. The scanner can handle reflective originals (Transparency Adapter sold separately) of up to 8.5 by 11.6 inches; features gamma-correction hardware; and ships with Adobe Photoshop 2.5, Olduvai's Read It Pro 3.0 OCR, and MirrorScan, the company's scanning software. $1799; Transparency Adapter $699. Mirror Technologies, 612/633-4450, 800/654-5294; fax 612/633-3136.

OrangePC 486 MS-DOS

If you gotta play the tune, play it as fast as possible, and do it on your Macintosh. With a clock-doubled 25MHz 486 processor in the driver's slot, you'll have a PC within your Mac that's faster than a 486 33MHz system in nearly every area except floating-point operations. The card ships with 4MB of RAM and plugs into the NuBus slot, and you can run both your Mac and the PC board at the same time. $1974. Orange Micro, 714/779-2772; fax 714/779-9332.

Pacific DirectNet 2.0

Trying to connect a Hewlett-Packard printer to a multiprotocol network? This card plugs into the modular I/O (MIO) port of the HP LaserJet IIISi, 4, 4M, 4Si, 4Si MX, PaintJet XL300, DeskJet 1200C, and DesignJet. With the card, Novell, TCP/IP, and EtherTalk users can all talk to the printer simultaneously. The card comes with thin Ethernet and 10BaseT connectors. $599. Pacific Data Products, 619/625-3663; fax 619/552-0889.

Pacific DirectNet 2.0

ProView 21-Inch Color Display

We could call this product the monitor that misses you. This .28mm dot-pitch, multiscanning display (up to 1152 by 870 pixels at refresh rates raging from 60Hz to 120Hz) has infrared sensors mounted on the front that sense when you are gone, and automatically switch off the monitor after five minutes. The

continues

product works with the built-in video of Quadras (except 700 and 900) and Centrises, as well as with standard video cards. $2099. Mirror Technologies, 612/633-4450, 800/654-5294; fax 612/633-3136.

ProView Color Portrait Display
This 15-inch color portrait display offers a resolution of 640 by 870 pixels at 80 dpi with a vertical refresh rate of 75Hz. The monitor features a .26mm dot pitch, front-mounted control knobs, and a removable tilt-swivel base, and is MPR II–compliant. $799. Mirror Technologies, 612/633-4450, 800/654-5294; fax 612/633-3136.

P-Touch PC

P-Touch PC
Believing earnestly that if you have named a thing, you have conquered it, Brother International presents a personal label printer that produces laminated, self-adhesive labels with which to name things. The label tape is available in over 40 color and width combinations, and the printer ships with labeling software and a printer driver that will work with other Macintosh applications. The company also includes custom fonts, special scalable symbols, premade label templates, and a tape cassette with 50 feet of labeling tape. $449. Brother International Corp., 908/356-8880; fax 908/469-4415.

TechJet Designer
When you need to see the big picture, you might want an ink-jet plotter. With the Model 5424, you can plot monochrome drawings on cut-sheet media, including bond paper, vellum, and polyester film, from 8½ to 24 inches wide. Resolution is 360 dpi, and a draft mode can finish an average D-size plot in four minutes. The plotter ships with 4MB of RAM (upgradable to 16MB) and features an LCD control panel; serial and Centronics parallel interfaces; and CALS G4, CCRF, CCGL, HPGL, and HPGL/2 compatibility. Macintosh cables are sold separately. The Model 5436 is identical except that it handles media up to 36 inches wide (E-size). Model 5424 $2995; Model 5436 $3995. CalComp, 714/821-2000, 800/932-1212; no fax.

TelevEyes/Pro
Convert your Mac video output (at up to the 832 by 624 resolution of a 16-inch monitor) to composite video or S-Video with this external device. It plugs into your Macintosh and your monitor and puts out composite and S-Video. The TelevEyes/Pro features seven flicker filters, overscan and underscan modes, color-key adjustment, and a three-button control panel with on-screen menus. With the genlock feature, you can lay your computer video over live video for titling, special effects, and computer animation. Input jacks for composite and S-Video are included, as well as Macromedia Action SE. $799.95. Digital Vision, 617/329-5400, 800/346-0090; fax 617/329-6286.

TrackMan
Tanned, rested, ready, and redesigned, this ADB trackball has a sweeping spiral shape and three buttons, each of which you can assign different tasks with the included MouseKey 1.2 software. You operate the trackball with your thumb, and a version is available for both right-handers and southpaws. $139. Logitech, 510/795-8500, 800/231-7717; fax 510/792-8901.

Troll Touch 14PT
You can't get much more hands-on than a touch screen. If you send Troll Technology your Performa 550, this company will pop the case and mount its touch screen on the monitor. The screen is wired internally to the ADB port, and Troll ships it back to you with a control panel that interprets the ADB input as mouse movements. You can set the software to recognize finger taps as clicks, or in drag mode it can send an automatic mouse-down command whenever you touch the screen. $695 including installation. Troll Technology, 805/295-0770; fax 805/295-0771.

Troll Touch 14PT

ViewFrame Spectra C Model SC21
An active matrix color projection panel that displays up to 1.4 million colors. The product ships with a remote control, a hard-shell carrying case, and an international power supply. The ViewFrame Spectra C Model SC21 can be factory upgraded to display NTSC, PAL, and SECAM video. $4995; video upgrade $895. nView Corp., 804/873-1354, 800/736-8439; fax 804/873-2153.

SOFTWARE

Ad Maker
An out-of-control classified-ad department is a nightmare, even if it is desktop published. This software contains a customer database complete with fields for address, phone, and account information. Operators enter ads directly into the database, exactly as they are to be printed. The cost is then calculated automatically, taking note of special options such as capitals and boldface. Ad Maker also generates invoices, and exports ads to your page-layout program. $1995. Integrated Software, 212/545-0110; fax 212/545-0198.

continues

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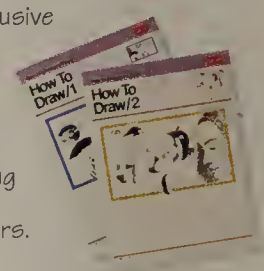

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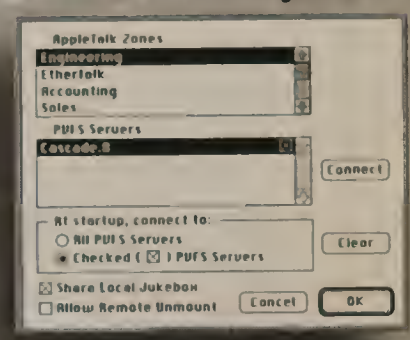
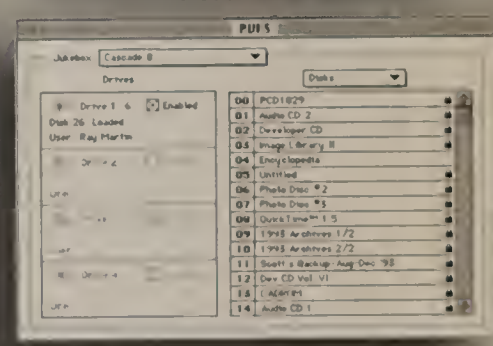
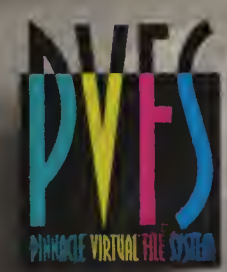
Cascades, Mt. Rainier National Park, Washington

PVFS Network Configuration



PVFS Utilities





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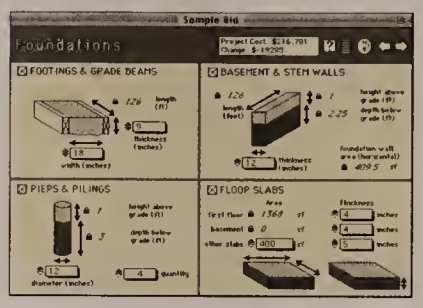
BidWorks

Get quick rough estimates as well as high-accuracy finished bids for residential construction projects and commercial buildings from this construction-cost–estimating software. Forms are included for calculating foundations, roofs, and structural and finish dimensions, as well as options for figuring labor costs. Users can change any of the 1000-plus unit prices that come with the software, and add additional items. $395. Turtle Creek Software, 607/589-4471; fax 607/589-6858.



BidWorks

Document Manager for Apple Macintosh

This cross-platform document-management and -control system for the Macintosh can manage any volume of data, paper, or film-based drawings across multiple sites and different computing systems. Users can retrieve related drawings and documents without knowing the documents' exact location. The package supports workstations and servers from Digital, HP, Sun, IBM, Apple, and others. The Mac client supports multiple search methods, including wild cards and range checking, and can store frequently used searches. 6MB min. memory; requires LC II, 13-inch display, System 7.0.1, MacTCP 1.1.1. $644. Cimage, 313/761-6550; fax 313/761-6551.

Firefall Arcade

Barrier droppers and the prisoner cube are the least of your worries as you fly fang-to-fang with ferocious fireworms. Fortunately, you'll find power-ups that fortify your ship, but will they flash by frequently enough for you to fend off the fiends? Be fortuitous in this fight to the finish, or fall in flames. 3MB min. memory; requires Mac LC, System 7, 8-bit color. $49.95. Inline Software, 203/435-4995, 800/453-7671; fax 203/435-1091.

Marvel Comics Screen Posters

It's clobberin' time! Berkeley Systems has teamed up with Marvel Comics to bring you a screen saver with over 35 still images from the Marvel archives. You get superheroes and supervillains—from the X-Men to Magneto, Captain America, and the Incredible Hulk—in classic confrontations, plus original cover pages, great moments in Marvel Comics history, and never-before-published artwork. The package ships with the After Dark engine. 'Nuff said! 2MB min. memory; requires color. $19.95. Berkeley Systems, 510/540-5535, 800/344-5541; fax 510/540-5115.

PowerLaunch II

Keep your files at your fingertips with this desktop launching agent. Users can store applications, documents, control panels, desk accessories, sounds, or any other double-clickable file in a series of icon palettes. Files can be configured to temporarily modify the Mac's sound and video settings, hide other open windows, and then return the environment to its original state. Automatic and group launching allow groups of files to be opened together and at predetermined times. 2MB min. memory; requires System 7. $35. Interealm, 303/366-8327; fax 303/360-9118.

ScanPrep

Designed to produce plate-ready line art, halftones, and color separations without operator intervention, this Photoshop plug-in module asks users to describe their scanning projects (or Photo CD imports) in multiple-choice nontechnical terms, and then reports back the technically correct scanner input settings for supported scanners. After the user scans the original, the ScanPrep Agent manipulates the scanned image inside Photoshop, adjusting gamma range, dot gain compensation, highlight and shadow settings, midtone placement, and correcting for printing processes and papers. Requires Adobe Photoshop 2.5. $395. ImageXpress, 404/564-9924; fax 404/564-1632.

Star Fonts I

Five astrological glyph fonts in several weights and styles come with accompanying text fonts for creating wheel charts. The included Star Gems font contains a full set of trans-Neptunian and hypothetical planet symbols, as well as all major and significant minor asteroids, alternate glyphs, and general-purpose symbols, such as yin-yang and Trinity symbols. Both TrueType and PostScript versions are included. $129.50. Time Cycles Research, 203/444-6641; fax 203/442-0625.

Star Fonts I

TSSnet 2.6

With this product you don't need a dedicated hardware router to connect your Mac systems to DECnet and LAT networks. Users get full access, including E-mail, terminal emulation, and file transfer. The system can coexist with AppleTalk and TCP/IP protocols, and supports the Communications Toolbox, plus DEC's CTERM. $249. Thursby Software Systems, 817/478-5070, 800/283-5070; fax 817/561-2313.

Vellum 2.5

The latest versions of these 2-D- and 3-D-design software packages feature software graphic accelerators, macros, autosave, and Palomar Software's Plot-

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tergeist plotter utility. The programs also support offset curves, useful wherever accurate parallel geometry is needed, plus color fills of closed objects, and automatic generation of splines from imported text data. The included Auto-Convert utility will import and export multiple IGES, PICT, EPS, HPGL, and ASCII files unattended. 8MB min. memory; requires Mac II, FPU. 2-D version $2495; 3-D version $2995. Ashlar, 408/746-3900; fax 408/746-0749.

VTK Plug In Pack
To control your consumer- or professional-level camcorders and VCRs, just pull up Adobe Premiere with this plug-in installed. The software is compatible with Control-L (LANC), Control-M, RS-422, RS-232, and ViSCA formats. You can use Premiere's control panel from within the program, or the VTK Remote and Setup screens to change port, device type, protocol, and other parameters. Requires Adobe Premiere 2.0. $99. Abbate Video, 508/376-3712, 800/283-5553; fax 508/376-3714.

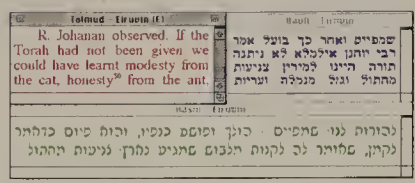
WaterMark Message Central
Integrate your fax, data, and voice services with this package and your Macintosh. With Voice Mail Professional, users can create an unlimited number of mailboxes, each with individual passwords and public messages. Callers can leave or receive messages, maintain their mailboxes, and request faxes. The software runs in the background under System 7; provides a hold feature; and supports rotary phones, automatic redial, and the Communications Toolbox. Requires System 7. $499. High Tide, 510/704-9927; fax 510/704-9933.

CD-ROMS

ColorBytes Mini Sampler
Twenty professional, high-resolution photographs are stored on this disc. They are stored in a variety of formats, including JPEG, TIFF, PICT, and QuickTime. The images print out as 8½-by-11-inch full-bleed pages with 200-line screens, or 17-by-22-inch posters with 100-line screens. Purchase price includes full rights for use of all images in advertisements, brochures, catalogs, fliers, or multimedia presentations. $79. ColorBytes, 303/989-9205, 800/825-2656; fax 303/988-6463.

Indiana Jones and the Fate of Atlantis
When Indy says, "Trust me," you know that the fun's about to begin. Join the world's most famous archaeologist and his companion, Sophia Hapgood, as they race against the Third Reich to find the fabled lost city of Atlantis. This time around you'll hear the whip-wielding hero, his friends, and his foes. The disc includes more than 40 characters and 8000 lines of digitized dialogue. Players choose their paths through the game; path options include puzzle-oriented Wits, action-oriented Fists, and dialogue-oriented Trust. $69.95. LucasArts Entertainment Company, 415/721-3300; fax 415/721-3342.

Random House Unabridged Dictionary, Second Edition
With 315,000 entries, this double-disc set includes such words as *carjacking, codependent,* and *wannabe.* Within the included search software, users access a definition by clicking on the appropriate word, or search by typing any part of a word and adding wild-card characters. Users can also search by category—for instance, words of French origin, slang or vulgar words, or Southwestern U.S. regionalisms. The disc is also available bundled with the book version. $79; with book $159. Random House Electronic Publishing, 212/572-2600, 800/733-3000; no fax.



Soncino Talmud CD-ROM

Soncino Talmud CD-ROM
Along with the original Hebrew and Aramaic texts of the Talmud, this disc includes the Soncino English translation, published by the Judaica Press, plus the classic Medieval Hebrew commentary of Rashi. Users can search both the Hebrew and English texts by typing one or two words from the relevant passage. Both texts can be simultaneously displayed and scrolled. An English topical index is included. $299. Davka Corp., 312/465-4070, 800/621-8227; fax 312/262-9298.

SuperToons
Way back before the name Superman meant Christopher Reeves in blue spandex, there were Superman cartoons. This CD-ROM contains four of them, digitized into QuickTime movies with audio: Mechanical Monsters, Terror on the Midway, Underground World, and Volcano. The disc also includes several TIFF-format still images from the cartoons. $49. Wayzata Technology, 218/326-0597, 800/735-7321; fax 218/326-0598.

Wrath of the Gods
For high adventure, you just can't beat those old Greek myths. What if you were abandoned by your grandfather the king to be raised by a centaur? If you can handle the psychological scars, you have a quest before you: to reclaim your birthright. You embark on adventures based on the exploits of ancient heroes, solving puzzles, dodging dilemmas, and encountering monsters from Greek mythology. Digital video of live-action characters has been composited onto backgrounds collaged from photos shot

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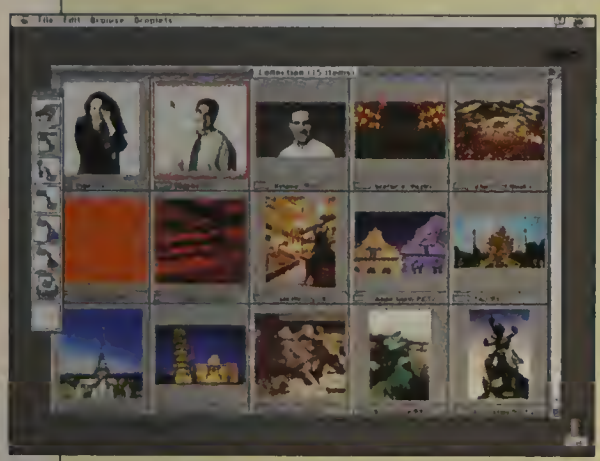
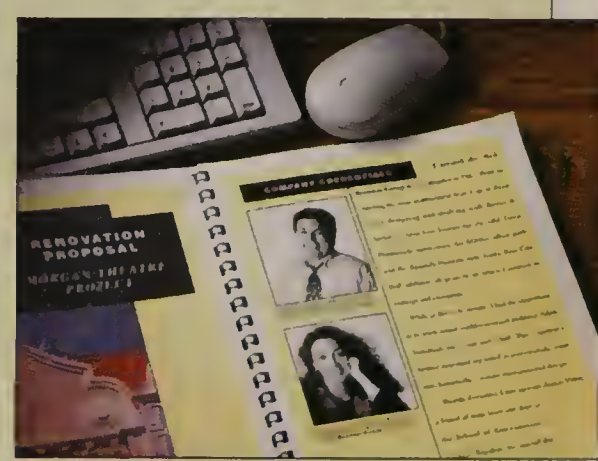
A simple demonstration of PhotoFlash software.

(A complicated demonstration isn't possible.)



1. Find a photo. *The PhotoFlash Browser makes it easy to view and pick a photo — they're all stored here, whether you got them from a CD, scanner or digital camera.*

2. Enhance it. *Crop, rotate and resize a picture with easy-to-use tools. Dust and scratch removal is automated, too. You can instantly preview adjustments you've made.*



3. Place it. *With a point and click, PhotoFlash automatically places the picture in your work. You can also record and automate the tasks you do most often.*

You used to have to learn a lot — and spend a lot — before you could work with photos on your computer. Now there's PhotoFlash.™ PhotoFlash is easy to use, right out of the box. It helps you organize pictures, enhance them and drop them into your work. It's fast. It's memory efficient. And it's just $279.* So if you want to make your work look great, get PhotoFlash. You'll get the picture right away.

Introducing PhotoFlash software from Apple.

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in Greece. And if your ancient history is rusty, the game gives background on myths. 4MB min. memory; requires color, Mac IIci. $69.95. Luminaria, 415/821-0536; fax 415/821-0167.

ACCESSORIES

CompuSet
If you've got a fax modem, you can connect this headset to it and have your phone conversations through your modem. The headset fits in the outer part of the ear, and the product includes an on/off adjustable volume control. You can dial outgoing calls from the keyboard, and the Quick Disconnect feature lets you put a call on hold and leave your computer without removing the headset. $99. Plantronics, 408/426-5858, 800/544-4660; no fax.

Konexx Kit
Being on the road is already a hassle; not being able to connect remotely to the home office is even worse. This telecommunications road kit has a high-speed acoustic coupler for handset-only emergencies, a 7-foot phone cable, a cable with alligator clips, an adapter to connect to Merlin phone systems, a screwdriver, and an extra 9-volt battery, all in a nylon carrying case. $169. Unlimited Systems Corp., 619/622-1400, 800/275-6354; fax 619/550-7330.

Lind Pocket Conditioner
If you're using NiCad batteries, the so-called memory effect can prevent you from carrying a full charge. According to the experts, conditioning your NiCads is the only way to keep them performing at 100 percent. This product plugs into the PowerBooks 140 through 180c and has a jack to connect the Apple AC adapter. Before charging your battery, the unit conditions the battery by fully discharging it. For a fully charged battery, conditioning takes four to six hours. $49.95. Lind Electronic Design, 612/927-6303, 800/659-5956; fax 612/927-7740.

BOOKS

The Complete AppleScript Handbook
From a crash course in programming fundamentals to checking and debugging scripts, this book is designed to teach beginning and experienced Macintosh users how to understand and use AppleScript. Danny Goodman explains the AppleScript language, gets users up and writing their first scripts, and provides several ready-to-use scripts. An included floppy disk contains Apple's AppleScript Run Time software package, as well as Chang Labs' TableServer for the purpose of managing tabular data. 512 pages. $35. Random House Electronic Publishing, 212/572-2600, 800/733-3000; no fax.

The Internet Complete Reference
It may not be the information superhighway, but right now it's the best we've got. It's the Internet, and Harley Hahn and Rick Stout want to help you surf the nets. They explain connecting to the system, electronic mail, Telnet, Usenet, Finger services, newsgroups and news readers, file formats, Wais database search and retrieval, and other topics that are absolutely essential to maintaining sanity (and lower phone bills) while hanging ten on electronic waves. There's also an Internet resource catalog with over 750 listings to get you started. 848 pages. $29.95. Osborne/McGraw-Hill, 415/549-6600, 800/227-0900; fax 415/549-6603.

Internet Starter Kit for the Macintosh
Slip your toes into the global electronic tide pool or ride the surf face-first, but learn how to do it properly. This book offers guidelines for connecting a Mac system to the Internet and covers what to do once you get there. An included disk contains MacTCP, Eudora, InterSLIP, Fetch 2.1.1, and TurboGopher, plus StuffIt Expander. Purchasers also receive a two-week trial connection to the Internet. Written by Adam Engst. 641 pages. $29.95. Hayden Books, 317/581-3500, 800/428-5331; fax 317/581-3550.

PageMaker for the Mac: Everything You Need to Know
Sure, it's an ambitious title for a book, but then learning PageMaker is an ambitious project. William Sanders guides readers from initial installation to final output with examples, explanations, tips, and tricks for professional results. He also describes how to use tint, process, and PostScript colors, and he points out some of the common traps and pitfalls not covered in the manuals. 384 pages. $24.95. Prima Publishing, 916/786-0426; fax 916/786-0488. m

PageMaker for the Mac: Everything You Need to Know

To have your product considered for inclusion in *New Products*, send an announcement with product name, description, minimum memory, peripherals required, pricing, company name, and phone number to New Products Editor, *Macworld*, 501 Second St., San Francisco, CA 94107. *Macworld* reserves the right to edit all product announcements.

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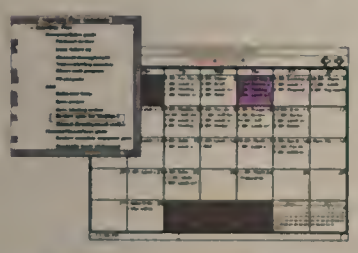

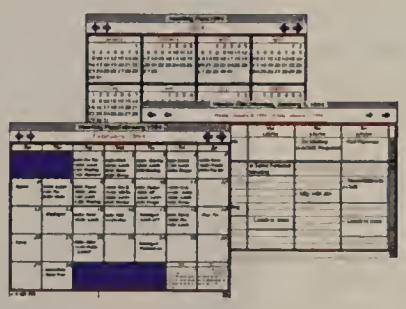

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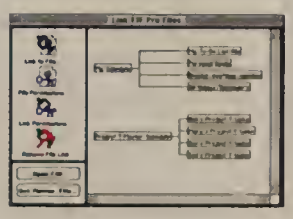
When you're ready for action, FTF Pro makes it easy to manage and delegate over the network. Share multiple lists of deadlined tasks with your work-group. View multiple schedules over the network in a single calendar view. Create your own easy-to-use templates for recurring projects to automate those things you do over and over. You can print any view—multiple calendars to a page, lists of things to do, plans, any kind of list or agenda. Easily customize printing to fit your appointment book so you stay on track no matter where you are.



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Circle 199 on reader service card

LaserWriter Select 360

Workgroup Printer

PROS: Excellent performance; low cost.
CONS: None. **COMPANY:** Apple Computer (408/996-1010). **DIRECT PRICE:** $1599.

MW ★★★★★

KEVIN CANDLAND

THE NEW LASERWRITER SELECT 360 is Apple's answer to Hewlett-Packard's LaserJet 4M—a RISC-based high-performance printer that for the past year has managed to take some of the workgroup printer market away from the Apple LaserWriter Pro 600 series.

The Select 360 was designed as a low-cost, high-performance printer for small-to-medium workgroups (fewer than ten users) in a full Macintosh or mixed Macintosh-and-Windows environment.

One of the most appealing aspects of the LaserWriter Select 360 is its price. At $1599 (expect a street price slightly lower), the Select 360 is a lot less expensive than the slower LaserWriter Pro 600 it replaces—it's also cheaper than the LaserJet 4M. A quick check of three San Francisco–based computer outlets revealed that the Select 360 was $400 cheaper than the LaserJet 4M. In fact, the LaserWriter Select 360 is priced closer to the LaserJet 4MP, which has a much slower (4-pages-per-minute) engine and less on-board RAM.

But price is not this printer's only strong point. The LaserWriter Select 360 performs better than the LaserJet 4M, and the Select 360 is much faster than the LaserWriter Pro 630. For raw performance, the Select 360's Fuji Xerox engine is rated at 10 ppm—2 ppm more than the LaserJet 4M and the LaserWriter 600 series' Canon engine. Macworld Lab used a 20-page single-font document to test the engine performance of the printers, and the Select 360 engine was about 16 percent faster at 600 dpi than the LaserJet 4M and LaserWriter 600. For processor-intensive tasks, such as complex PostScript and multiple-font files, the LaserWriter Select 360's low-cost, high-performance AMD 29200 RISC microprocessor edged out not only the Motorola 68030 CISC–based LaserWriter Pro 600 series, but also the Intel i960 RISC–based LaserJet 4M. When we averaged the test results at 600 dpi, the Select 360 was 31 percent faster than the LaserJet 4M and 25 percent faster than the LaserWriter Pro 630. (In fact, the Select 360 was even faster than Apple's flagship printer, the LaserWriter Pro 810.) For now, the Select 360 is probably one of the fastest printers in its price range.

To enhance the performance of the Select 360, a firmware-based TrueType rasterizer is included. A lot of printers, including the HP LaserJet 4M, do not offer a TrueType rasterizer. Without one, the computer has to convert TrueType fonts into unhinted Type 1 fonts, download them to the printer, and rasterize them for every printout. With a TrueType rasterizer, the printer itself rasterizes the fonts, which makes printing much faster. Also, after the TrueType fonts are initially rasterized and printed, subsequent documents using the same fonts will print a lot faster, since all the font information will be stored in the printer's RAM. I noticed at least a 30 percent speedup for the second copy after the initial page was printed.

The LaserWriter Select 360 is EPA Energy Star compliant. After a period of inactivity, the printer automatically goes into sleep mode, which consumes a lot less power. An added benefit is that the

already quiet (47dB) printer gets quieter (36dB); that's about as loud as an external hard drive. I commend Apple for being the trendsetter in getting its new products to be Energy Star compliant.

In addition to lower electric bills, businesses can have a networked plain-paper fax machine. One of the new features of PostScript Level 2, the page-description language used by the LaserWriter Select 360 and many newer printers, is the possibility of integrating fax capability with printer capability. The LaserWriter Select 360 is the first printer from Apple to carry an optional PostScript Fax Card at $299. With the LaserWriter Select 360 on a network and the fax option installed, everyone has access to a regular fax machine—sending and receiving faxes from Macintosh, DOS, and Windows platforms.

Sending a fax is as simple as printing a regular document. When you print from your application, a fax option appears in the dialog box. Select Fax and another dialog box appears, prompting you for the fax number. You can either enter the fax number manually or select a number from the built-in address book. You can also send the document to several people by grouping recipients from the address book—something a regular fax machine can't do. And as with a regular fax machine, you can delay sending a fax until off-peak hours to reduce phone costs. The only drawback to sending faxes via the printer is that all your originals need to be in an electronic format.

When PostScript fax printers are involved in both sending and receiving a fax, the output resolution of the fax document is identical to printed output. For example, if you send a fax via your Select 360 to someone who has a fax-card-equipped 360, the fax is printed at 600 dpi. (Without the cover page, you probably won't be able to tell it's a fax document.) Fax-transmission costs are also lower because the file size for the PostScript code is smaller. When sending to Group III faxes, usually at 200 dpi, the output still looks better.

Like the LaserWriter 600 Pro series, the Select 360 has a selectable 300-dpi or 600-dpi setting and a FinePrint option. FinePrint is supported only in the 300-dpi mode. Macworld Lab examined the 360's output at 300 dpi and 600 dpi and noticed that even with FinePrint, the quality of the text at 300 dpi isn't quite up to the quality at 600 dpi. The only reason to use 300 dpi with FinePrint is faster print time. Under close inspection, the text output from the LaserJet 4M with Resolution Enhancement Technology doesn't look as crisp as the LaserWriter Select 360 output. However, from a normal reading distance you won't notice the difference.

Unlike the Pro 600 series, the Select 360 lacks PhotoGrade. Since the Select 360's default setting is 600 dpi, more lines per inch or gray scales are available, and the output should rival the 300-dpi PhotoGrade. I think Apple should have included a PhotoGrade option, since PhotoGrade in 300-dpi mode sometimes yields better-looking graphics than the 360's plain 600-dpi mode.

Apple's commitment to cross-platform compatibility, or survival on a mixed network, has given the LaserWriter Select 360 built-in LocalTalk, a 25-pin RS-232, and a parallel Centronics port. Unfortunately, EtherTalk is absent, so you are limited to LocalTalk performance. All ports are simultaneously active, which means the printer can accept jobs from both DOS and Macintosh platforms without changing a single setting. The LaserWriter Select 360 also automatically switches between PostScript Level 2 and PCL 5; the latter is more common in DOS applications. The Select 360 lacks a SCSI port; therefore, no external hard drive can be attached to the printer for font storage. If you use a lot of different fonts, either upgrade the printer from 7MB to 16MB and download the fonts at the beginning of the day, or buy the LaserWriter Pro 630.

Setting up most Apple products is pretty straightforward, and the LaserWriter Select 360 is no exception. It took less than ten minutes to get the printer online and printing. The lack of a front-panel, LCD-type status display shouldn't be a problem, since the Apple LaserWriter driver, combined with the LaserWriter software utility and the status light, provide more than enough information for most people to figure out what's going on.

The clear, illustrated manual also helps. It guides the user through installing the printer, setting up the software, changing the toner, installing the optional sheet feeder, and troubleshooting any problems. The manual does not illustrate upgrading the memory or the optional fax card; only a registered Apple dealer can perform these changes without voiding the warranty.

The Select 360 has a built-in paper tray that holds 250 sheets, an optional 50-sheet tray, and an optional 500-sheet tray. That's a total capacity of 800 sheets—more than enough for a few days on a small network. Installing the optional sheet feeder is a cinch. All you need to do is remove the original paper cassette, stack the printer on top of the sheet feeder, snap the plastic retainers to lock the printer and the sheet feeder together, and replace the original cassette. You select the paper tray through the printer driver.

The LaserWriter 360 is arguably one of the best printers to come from Apple. If you have a small LocalTalk or mixed network, look no further. This is the printer you should buy. For bigger networks, consider buying more than one; they're more cost-effective than a 20-ppm printer.—MARK HURLOW

MW LAB How Fast Is the LaserWriter Select 360?

Best result for each test.

Times are in seconds. Shorter bars are better.

	Multiple Fonts: Print speed for a typical 7-page Microsoft Word 5.0 document with a variety of fonts, sizes, and styles.	Single Font: Print speed for a 20-page Word 5.0 document with double-space, 12-point Courier text in plain, bold, and italic.	MacDraw Pro: Print speed for a complex drawing with few special effects, over 2000 simple objects, and several lines of Helvetica text.	FreeHand 3.1: Print speed for a complex graphic with special PostScript effects. Illustration had nonlinear blends and Bézier curves.	PageMaker 5.0: Print speed for a 4-page newsletter with several fonts, a MacPaint image, and 3 gray-scale TIFF images.	TrueType: Print speed for a 1-page Word 5.0 document containing 4 TrueType fonts in various sizes.
Tested at 300 dpi						
Apple LaserWriter Select 360[A]	72	137	81	286	91	48
Apple LaserWriter Pro 600[B]	127	162	114	442	108	63
HP LaserJet 4M[C]	153	161	121	390	93	72
Tested at 600 dpi						
Apple LaserWriter Select 360	113	141	89	327	93	54
Apple LaserWriter Pro 600	154	164	125	501	124	62
HP LaserJet 4M[D]	191	163	111	488	136	77

[A] FinePrint on. [B] FinePrint and PhotoGrade on. [C] RET on. [D] RET off.

Printers were tested with a Centris 650 with System 7.1, 8MB of RAM, a Quantum LPS230 internal hard drive, AppleTalk on, and background printing off

Microsoft FoxPro for Macintosh 2.5

Relational Database

PROS: Greatly improved interface and reporting; fast data-table searching; cross-platform compatibility. **CONS:** Serious use requires programming background. **COMPANY:** Microsoft Corporation (206/882-8080). **LIST PRICE:** $495.

MW ★★★★

FOXPRO FOR MACINTOSH 2.5 IS dazzlingly fast and easy to use, both for developers and entry-level users. It's the most serious challenge to ACI US's 4th Dimension yet to appear.

FoxBase had no serious competitors among Mac relational databases for quick searching and sorting. At the FoxBase command-programming level, the product was recognizably dBase, a product that antedates not just the Macintosh but DOS itself. As a result, FoxBase featured a user interface that wasn't as Mac-like as in Helix Technologies' Helix or 4D, but the interface restrictions facilitated DOS-to-Windows-to-Mac conversions.

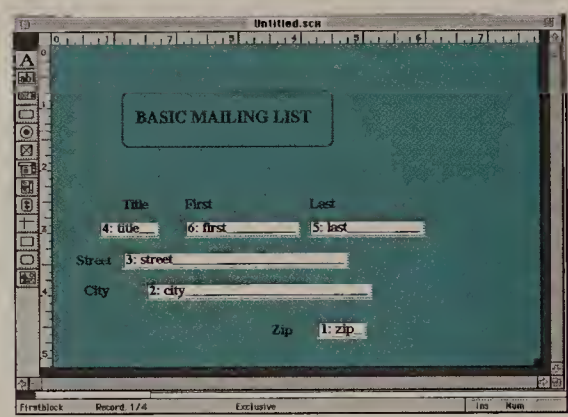
Foxy Design

FoxPro 2.5 has a respectable Mac interface while maintaining compatibility with its DOS and Windows (and upcoming Unix) versions. This means that you can, in principle, design a real-world relational application with only mouse-clicks and a bit of typing to fill in the blanks in dialog boxes.

Consider the main elements of an application: data tables, their relations, input screens, and reports. You now establish FoxPro data tables and relations through dialog boxes that are as simple as those in FileMaker Pro. The easy-to-use Screen Builder has not only a rich graphical tool set (see "Looks, Style"), but also a transporter program for automatically converting screens to other platforms. A similar set of graphical tools is available in the updated Report Writer, and reports can take advantage of FoxPro's relational query-by-example to collect data easily from linked tables anywhere in the data universe.

Microsoft Graph is now included in the FoxPro package, so reports can feature presentation-quality charts. If you don't mind a more austere format, you can use QuickScreen and QuickReport to get plain-vanilla input and output with essentially no effort on your part other than choice of fields and summaries—Microsoft "wizards" like those in Excel detail your options in a set of self-explanatory screens. For simple applications, you can even bypass these functions and use FoxApp, which generates applications using only a handful of dialog boxes (see "Beginner's Luck").

A curious user, inspecting what FoxApp hath wrought on a basic application, will notice the generation of many little files with extensions such as .SCX, .TBK, and .FPT. These files are at the heart of the new FoxPro, in which all applications, no matter how graphical and point-and-click, are collections of little files in an extended version of the XBase language.

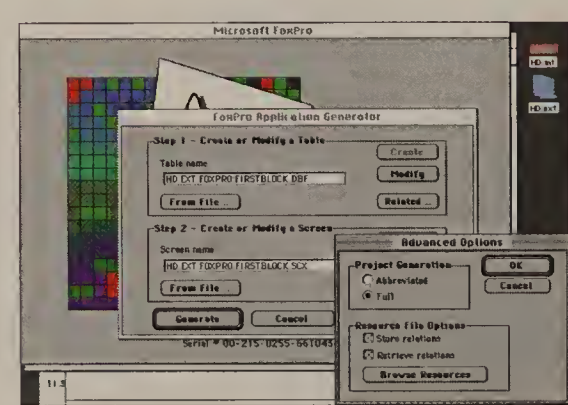


Looks, Style This plain data entry screen was created with FoxPro's Screen Builder in less than a minute, but using the tools in the palette at the left, you could beautify the screen with imported graphics, buttons, and other highlights.

If you want to modify your FoxApp work, you'll have to learn about these files and the language. If you want to use the full power of FoxPro (for example, linking to Excel files and modifying their contents), you should expect to spend some time with FoxPro's 500-page developer's guide and 1000-page language reference.

Out of Its Own Way

Earlier Fox products were fast; with Rushmore (Fox Software's search technology), FoxPro is about 50 times faster than its Mac competitors on large single-table searches. Although Rushmore is a combination of several clever ideas, its main trick is an indexing scheme that provides a RAM-based index for data files on your hard disk, combined with search-optimization algorithms. Roughly, when you perform a search, FoxPro decides from data in RAM which records you are requesting and scoops the selected records from your hard disk in a single pass—the speed is comparable to that of a single-record search on an indexed field. The only Mac product that even approaches FoxPro for speed is the flat-file database from ProVue Development, Panorama II, which keeps active data files in RAM at all times.



Beginner's Luck While FoxPro isn't the right product for users who are struggling with the database Microsoft Works, adventurous database beginners will find that FoxApp is ideal for creating simple applications without actual programming.

This speed advantage changes the way developers design projects. Because there's speed to spare, conceptually simple designs (small number of larger tables, small number of relational links) become preferable to complex designs consisting of myriad linked, smaller tables. A multiuser design doesn't depend on a fast server to compensate for slow clients (FoxPro is not a client-server product, although ambitious developers could program an analogous data-handling scheme). In the past, Mac database developers have designed around slow hardware and friendly but slow database software.

A Different Database World

For projects that are clearly suited to a client-server architecture with constant, heavy network traffic, Blyth Software's Omnis and 4D are hard to displace; and for projects that require frequent revision or involve document management, Helix has advantages. But for many familiar business multiuser projects (4 to 20 users) that handle large amounts (hundreds of thousands to millions of records) of data, FoxPro offers excellent performance, in contrast to the unacceptably slow performance of its competitors. FoxPro is the only product that offers compatibility to DOS as well as across to Windows, and it's backed by an ominously large and determined vendor. In real life, most database developers use more than one database product, matching various databases' strong points to individual clients' needs. FoxPro for Macintosh isn't going to shove all the other Mac relational databases out of these developers' tool kits, but it has significantly expanded the range of circumstances in which FoxPro is the first choice.—CHARLES SEITER

Macintosh TV

Macintosh Computer

PROS: Good software support of TV tuner; sleek black design. **CONS:** Slow; no expansion slot; can't display video in a window; computer must be on for TV or CD to operate; lame TV-lockout security mechanism. **COMPANY:** Apple Computer (408/996-1010). **DIRECT PRICE:** $2079.

MW ★★

THE MACINTOSH TV REPRESENTS Apple's slow but steady push into the consumer electronics field, a charge first led by last year's PowerCD, a sleek but slow CD-ROM drive that atones for its sluggishness by providing excellent support for audio CDs and Photo CDs (see *Reviews*, *Macworld*, January 1994).

"Sleek but slow" aptly describes the Macintosh TV. This TV-and-Macintosh combination is an appealing package, wrapped in a stealthy black I wish my Mac were wearing. The Mac TV includes a business-card-size remote control that lets you graze the airwaves, play audio CDs using the built-in CD-ROM drive, adjust the volume, and even shut down the computer. A control panel nicely supports the built-in TV tuner. Completing the package is a selection of software: preinstalled on the computer's internal 160MB hard drive are ClarisWorks (and an assortment of document templates), Mavis Beacon Teaches Typing, the American Heritage Dictionary, and a T/Maker clip art collection. Numerous CD-ROM titles are also included, as is Apple's PC Exchange utility, which lets the computer read and write DOS-format disks.

Apple's direct price: $2079. That's several hundred dollars more than Apple's low-cost leader, the Performa 475—which is considerably faster than the Mac TV. Now, the Performa 475 doesn't have a CD-ROM drive or the TV features. Is the Mac TV's higher cost worth those extras, especially given its slower performance? This viewer isn't convinced.

A Closed Box

The Mac TV uses the same all-in-one case design as the roughly $1200 Performa 550 (see "New 040 Macs," *Macworld*, December 1993). Both contain a tack-sharp 14-inch Sony Trinitron video monitor. Just above the Mac TV's screen, though, is a sensor for the remote control.

Like most of Apple's low-end offerings, the Mac TV includes the Apple Standard Keyboard, which lacks the convenient shortcut and navigation keys provided by the larger, costlier Apple Extended Keyboard II. You can use the larger keyboard with the Mac TV, but you'll mismatch your ensemble: the big keyboard doesn't come in black.

The Performa 550 provides one Processor Direct Slot into which you can slide a variety of expansion boards. Alas, the Mac TV's single, nonstandard expansion slot is occupied by the television tuner, so forget about ever adding an accelerator board, a QuickTime video-capture board, or any other kind of board. All you can put inside a Mac TV is more memory—the machine's barely adequate 5MB is expandable to 8MB. (The Performa 550 is expandable to 36MB.)

You'd expect a computer that doubles as a TV set to have good color-video features, but the Mac TV disappoints here, too. Its 512K of video memory (VRAM) allows only 256 colors when the machine is in computer mode. Thus, QuickTime movies and color scanned images have a coarser appearance than they do on a Performa 550, whose 768K of VRAM allows for roughly 32,000 colors.

The Mac TV's back panel sports the usual Mac connectors: SCSI, printer, modem, and ADB (two of these). There's

Macintosh TV

also a coaxial port that accepts a standard cable-TV hookup; a video-input jack that accepts a composite video signal from a camcorder or other video source; and two sound-output jacks that enable you to connect the Mac TV to an external stereo system. On the computer's front panel, between the speakers, are volume-control knobs, screen-brightness controls,

continues

MW LAB Macintosh TV: How Fast Is It?

CORE-PERFORMANCE INDEX

Times as fast as a Classic (Classic = 1.0).

Use these standard ratings of overall performance, based on a core test suite, to compare systems across classes.

ENTRY-LEVEL-SYSTEM PERFORMANCE TIMES

Times are in seconds. Shorter bars are better.

Use these results to compare the performance of systems for different types of real-world tasks within each class. For each type of system, results can be compared with other *Macworld* Entry-Level-System Performance Times.

Best result in test. Products are listed in decreasing order of overall performance.

	Common	Scientific	Processor	Drive-Access	Video-Display	Floating-Point
	Typical business tasks in Microsoft Excel and Word that use the Mac's processor, drives, and video display	We added to the common tasks several scientific calculations (which use floating-point math).	Several tasks in Claris FileMaker Pro, ClarisWorks, Deneba UltraPaint, and Microsoft Excel and Word	File-opens in Microsoft Excel and Word, and disk-based sorts in Claris FileMaker Pro.	Horizontal and vertical scrolling in ClarisWorks, and Microsoft Excel and Word.	Scientific recalculations (which use floating-point math) in Microsoft Excel and ClarisWorks.
Macintosh Quadra 605	10.2	10.9	82	28	98	107
Macintosh Performa 460	5.0	5.2	169	48	201	257
Macintosh LC III	4.0	4.1	211	58	241	328
Macintosh TV	2.9	3.0	276	74	304	480
Macintosh LC II	1.9	1.9	432	115	489	740

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Circle 260 on reader service card

and a headphone jack. The speakers themselves don't sound as good as a pair of external speakers or even an AudioVision 14 monitor, but they're acceptable for TV and CD listening.

TV Time

Unlike Apple's costlier and faster AV Macs, the Mac TV can't display video in a small window. When you press the button on the remote control (or issue a customizable keystroke), the Mac's desktop fades out and a full-screen video image fades in. You'll notice that Beavis has a somewhat jagged, pixelated look, which is caused by the way the Mac TV uses its limited VRAM to display a video signal.

Also unlike an AV Mac, the Mac TV can't capture QuickTime movies from its video sources. You can, however, grab a single frame of video by using the standard ⌘-shift-3 snapshot sequence.

Issue the switcheroo key sequence a second time, and the TV signal surrenders to the video-input port—which yields a blank screen unless you have a video source connected. It'd be convenient if the Mac TV could sense when no video source was connected and omit the video jack from its display cycle.

Although the Mac TV doesn't let you work and watch "Wonder Woman" at the same time, it can play the TV's sound while the Mac's desktop is visible. The TV Setup control panel lets you configure this, as well as lock out inactive channels and activate closed captioning. Parents and teachers can also specify a password that must be typed before the computer switches to TV mode. But take heart, kids—it's easy to defeat: just yank the TV Preferences file out of the System Folder and restart.

Too Little for Too Much?

The Mac TV's lack of an expansion slot wouldn't be as significant if the computer were faster. Its 68030 processor runs at a fairly swift 33MHz, but the rest of the computer runs at half that speed. The lackluster performance is adequate only for running the types of entry-level applications that accompany the computer.

The Mac TV's mediocre performance and lack of expansion options detract from its otherwise considerable appeal. The Mac TV does succeed in putting a computer, TV set, and CD player in a relatively small package. But if you can live without the built-in television tuner, you can get faster performance and better expandability from several less-expensive Performa models—without sacrificing the bundled software and hardware. Buy yourself a TV set with the money you save.—JIM HEID

Crosstalk for Macintosh 2.0

Terminal-Emulation Software

PROS: Large range of emulation and file-transfer protocols; sophisticated scripting language; built-in text editor. **CONS:** Script editing is complex; no dialing directory; no fallback phone numbers; can't change screen font. **COMPANY:** Digital Communications Associates (404/442-4000). **LIST PRICE:** $195.

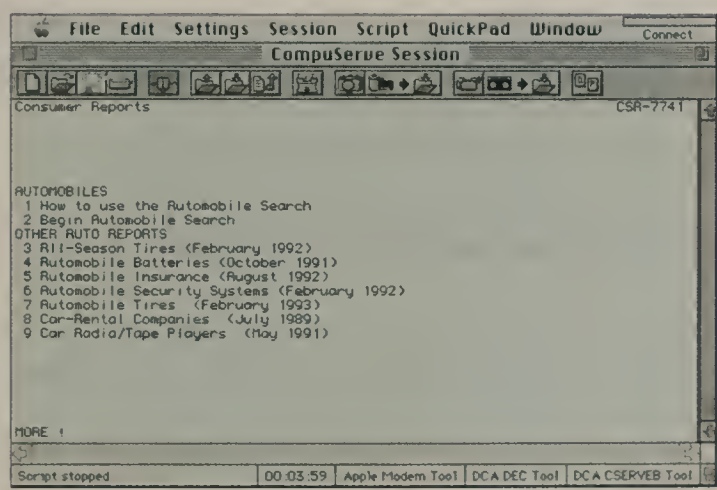
MW ★★★

CROSSTALK IS A POPULAR TERMINAL-emulation program in the non-Macintosh PC world, and now Crosstalk runs on the Mac too. Based on Digital Communications Associates' (DCA) Windows edition of Crosstalk, the Macintosh version offers a wide range of terminal-emulation and file-transfer tools—more than most other packages in the same price range.

The package includes two well-written manuals, a concise user's guide, and a hefty programmer's guide. The program supports 13 terminal emulations: ANSI PC, five DEC VT terminals (VT52, VT100, VT102, VT220, and VT320), IBM FTTERM, HP 700/94, IBM3101, VIDTEX, WYSE, ADDS, and PCTERM. Of these, the IBM and HP emulations appear in no other similarly priced Mac emulator. Moreover, the file-transfer protocol suite is equally rich: Xmodem, Ymodem, Zmodem, Kermit, CompuServeB+, and IND$FILE. The IND$FILE protocol is used by IBM's nationwide IBMLink online service; Crosstalk is the first Mac product to support it. The program also sports a sophisticated script language, a customizable button palette, and a built-in text editor.

Installation is easy, and a supplied set of quick-start scripts lets you start using popular online services such as CompuServe and Delphi right away. The scripts are even self-configuring, prompting you for telephone number, user ID, and password on first use. The canned scripts make liberal use of Crosstalk's configurable button palette called QuickPad. QuickPad buttons let you invoke scripts or select prestored keystrokes with a single click. The QuickPad editor is a MacDraw-like window in which you can draw virtually any size palette containing buttons, text, lines, pictures, and icons.

Some users will want to set up their own scripts, and Crosstalk's learn mode makes it easy. You simply turn on learn mode and perform whatever online action you want to record in a script. Crosstalk builds the script in Crosstalk Application Script Language (CASL). You need not learn the scripting language unless you plan to modify existing scripts, but should that need arise, DCA's excellent CASL documentation makes the process relatively painless as programming goes. The C-like CASL language supports such sophisticated features as arrays, parameterized functions, and exception-handling subroutines. You edit CASL scripts using a standard text editor and then compile the scripts using the built-in CASL compiler. Given the language's complexity, Crosstalk script modification is not for the faint of heart.



Crosstalk Talks to CompuServe Crosstalk includes a number of preconfigured scripts for popular online services. All make liberal use of Crosstalk's QuickPad button palette.

Nothing is perfect, however, and Crosstalk has its rough edges. Telephone dialing is one of them. Crosstalk doesn't keep a central dialing directory, so you must manually type phone numbers each time you set up a session. Worse, there is no way to enter an automatic fallback phone number to dial in case a main number is perpetually busy. Both of these capabilities are standard fare in other Mac communications software. Finally, although you can change the screen's font size, to anything from 8-point to 18-point, there is no way to change the font itself from the default Monaco, a limitation that international users—for example, Russians—may find annoying.

Overall, Crosstalk is a commendable first entry into the Mac communications market, with a feature set that well matches its competition. And if you need IBM or HP interoperability, Crosstalk has them at the lowest price going.

—MEL BECKMAN

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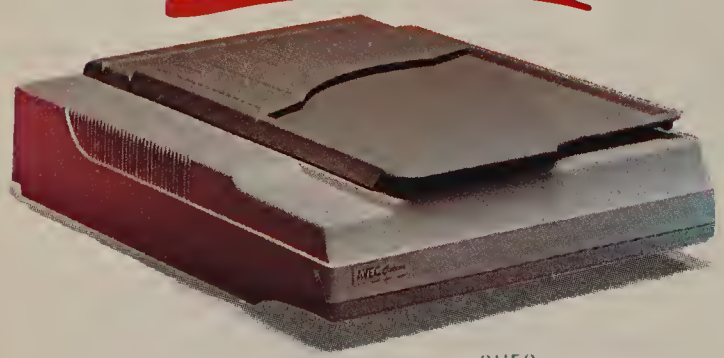

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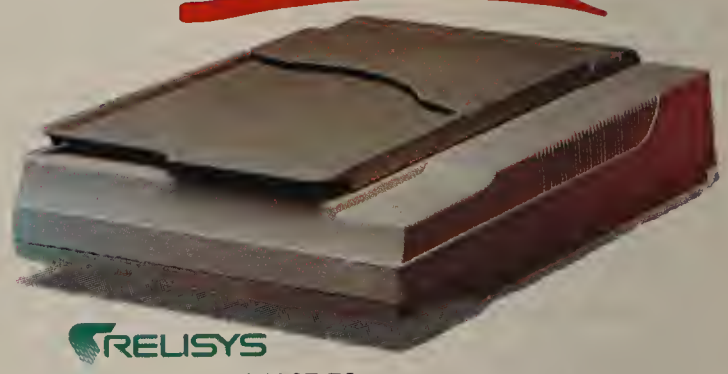

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Tax-Prep Programs

Tax Software

Andrew Tobias' TaxCut 1993

PROS: Navigator feature greatly simplifies tax preparation; comprehensive Help menus with search function. **CONS:** Skimpy manual; only two state versions; 32-bit addressing problem on Quadra 800. **COMPANY:** MECA Software (203/255-1441). **LIST PRICE:** $79.95; state programs $39.95 each.

MW ★★★★

MacInTax 1993

PROS: Sophisticated tax-preparation and -analysis tools; EasyStep feature guides you through tax-preparation process. **CONS:** Dense manual; Help menus fail to clearly explain arcane IRS regulations; cannot round off to whole dollar amounts. **COMPANY:** ChipSoft (602/295-3110). **LIST PRICE:** $69.95; state programs $39.95 each.

MW ★★★

IF SPENDING LATE NIGHTS WITH A calculator, pen, and pencil as tax time approaches is too daunting for you, consider doing your taxes with a tax-preparation program. Two for the Mac are Andrew Tobias' TaxCut from MECA and MacInTax from ChipSoft.

Andrew Tobias' TaxCut

TaxCut's skimpy manual tells you how to install the software, who to call for technical support, how to open the program, and not much more. Instead, the program's liberal Help menus (indexed and context-sensitive) are designed to take you through the tax-preparation process a step at a time. There are even bookmark and search features to guide you to the topics you need to explore.

TaxCut's Navigator guides you step-by-step through the entire process, insulating you from the actual tax forms. A Shoebox feature allows you to bring order to disorganized records. You enter the figures from each receipt, and they're automatically added to the proper form.

TaxCut can import information from last year's return or from financial programs such as Managing Your Money and Quicken. A What If feature allows you to explore the impact on your return from various deductions and reporting options. Your tax data can be automatically transferred to TaxCut's state editions. Unfortunately, California and New York are the only state forms available.

When you're finished, the program's audit function flags deductions that might trigger an audit and lists errors or items that are missing in your return.

Despite the lack of written instructions, TaxCut's Navigator is able to take you from the beginning to the end of your return efficiently and reasonably fast. The only fly in the ointment is an occasional crashing bug. I encountered it when closing the Shoebox window. I was able to avoid this problem by turning off 32-bit addressing on my Quadra 800. Otherwise the program worked flawlessly.

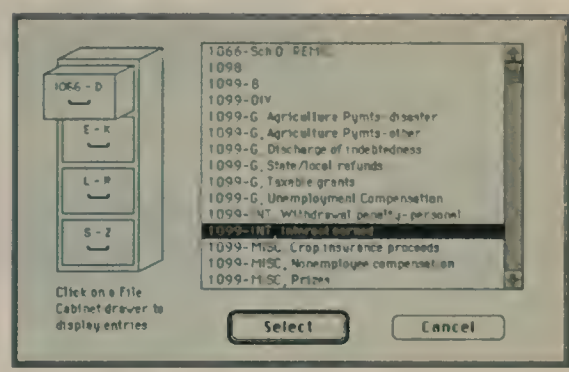
MacInTax

MacInTax offers its classic approach, which allows you to enter information directly on your tax forms, or its EasyStep feature, which places a question-and-answer window above your tax form display. You answer the questions in the interview, and the figures automatically appear on the correct tax form. Once you begin to enter figures in your return, you'll find that you are limited to whole dollar amounts. You cannot enter figures containing amounts in cents, nor will the program round them off for you.

A File Cabinet feature (similar to TaxCut's Shoebox) is useful in organizing your tax data. As with TaxCut, you can transfer data directly from last year's MacInTax or import it from your financial-planning software.

If you don't have final figures for a particular tax category, you can enter estimates. MacInTax can display a status report that shows you estimated or incomplete information, to quickly let you know what material you need to finalize your return. A Deduction Finder helps you seek out deductions you might have overlooked. Like TaxCut, MacInTax has a feature that warns you of items on your return that the IRS might flag for a potential audit.

Putting It All Together TaxCut's Navigator serves as your virtual accountant, taking you through the steps of preparing your tax return.



Sorting It All Out MacInTax's File Cabinet allows you to record your individual receipts by category and automatically enters them in the appropriate tax forms.

If you hit a stumbling block and don't know what sort of information you need for a particular tax form, context-sensitive help can guide you. Unfortunately, the help menu does little more than restate IRS instructions and guidelines; it would be more helpful if it explained them. Members of ChipSoft's technical-support staff are excellent about guiding you through installation and use of the program, but they (and the publishers of TaxCut) cannot offer tax advice. If the manual and Help menus aren't enough to get you through your tax return, you will still need a tax guide of some sort, or advice from a professional tax preparer.

MacInTax comes with a reasonably thorough manual, but it's written in a dry, clinical style that is reminiscent of the IRS's own instruction manuals. A more readable manual would have been a plus.

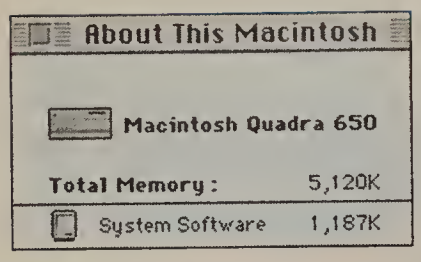
The box lists a minimum System software version of 6.0.5, but MacInTax uses TrueType fonts (which are supplied). These require Apple's TrueType INIT to work under System 6—but the INIT isn't supported for System 6.0.5 (it's for 6.0.7 and 6.0.8).

Time to Fire Your Accountant?

If your returns are straightforward, you can probably prepare and submit your tax return with little cause for worry. MacInTax provides a reasonably detailed manual and a reliable, structured interface for building your tax return. MacInTax offers more forms than TaxCut does, and has 20 state edition packages, but its inability to round off figures and the requirement for TrueType fonts may be a problem for some users. I prefer TaxCut's free-form approach to tax preparation, its Navigator feature, and its flexible Help menus. TaxCut makes filling out your tax return a smooth, almost relaxing process. That is, until you have to write that check to the IRS.

—GENE STEINBERG

Just Click and Double Your RAM



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RAM Doubler™ gives your Mac twice as much memory to open applications. You'll be rid of "Out of Memory" messages forever.

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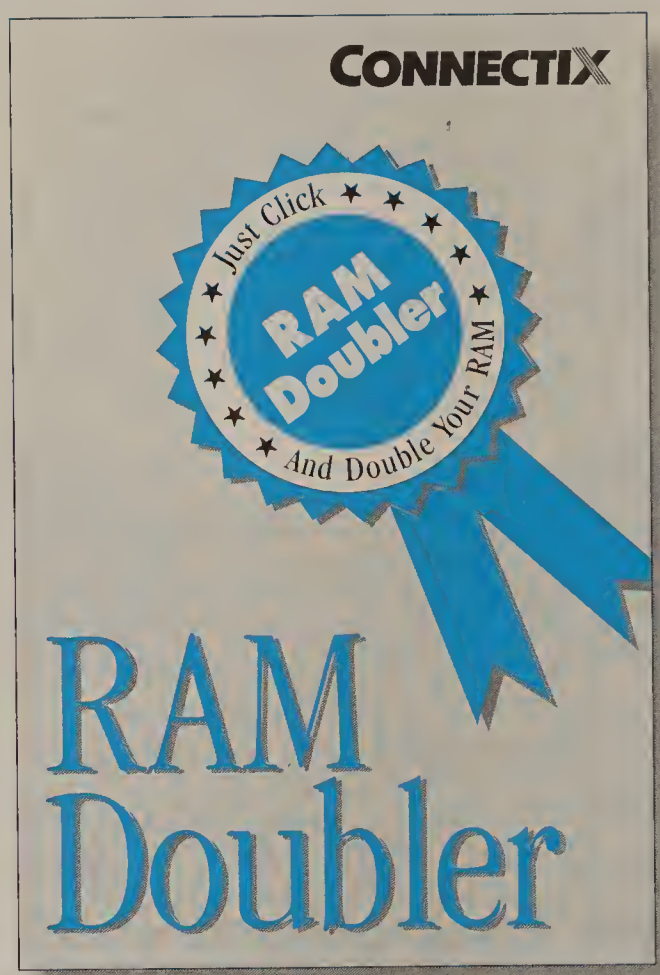
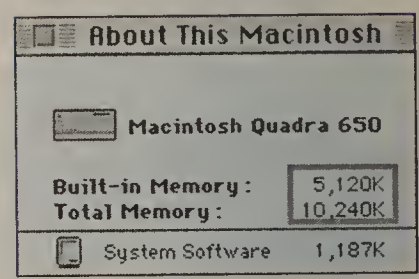
- United States Patent Number 5,063,499. Other patents pending.
- Requires Mac II or better (68030 or 68040 processor), System 6 or 7, 4 MB RAM (hard disk required for Macs with 4 to 6 MB RAM).



The best thing about RAM Doubler is that it's easy to use. Just click to double your RAM. It's that fast. It's just that easy.

This package includes the one-step installer for the RAM Doubler software and an easy-to-use manual. Nothing else is required.

It's never been easier or more affordable to add memory to your Mac.



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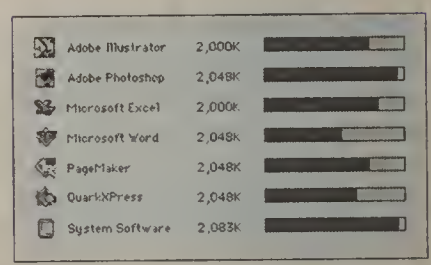

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Tax Planning

Tax Software

MacInTax Tax Planner

PROS: Provides quick five-year tax projections; can import financial data from other applications. **CONS:** IRS instructions not included; doesn't support all tax forms and functions. **COMPANY:** ChipSoft (602/295-3110). **LIST PRICE:** $19.95.

MW ★★★

MacInTax Tax Savings Guide

PROS: Good examples used to illustrate tax strategies; good search features. **CONS:** Can't print, copy, or export tax tips; some strategies hard to understand. **COMPANY:** ChipSoft (602/295-3110). **LIST PRICE:** $14.95.

MW ★★★

CHIPSOFT, MAKER OF MACINTAX, IS now offering two spinoff products—MacInTax Tax Savings Guide and MacInTax Tax Planner—to help you plan your long-term tax strategy and minimize your tax liability.

Tax Planning

Tax Planner operates almost exactly like MacInTax itself, automatically calculating taxes based on your current financial data. But instead of providing you with a completed federal return, Tax Planner allows you to construct a five-year forecast of your tax liability, projecting tax figures through 1997 in a concise summary format.

Tax Planner uses an easy-to-follow interview format to collect tax data. As you answer questions, the program plugs the appropriate data into the proper lines of the forms. If you prefer a less guided approach, you can type data directly into forms or import the data from your 1992 MacInTax files or from other financial packages such as Quicken or CheckFree.

Once your current data is entered, you can construct as many as five different tax scenarios. For example, you can estimate the tax impact of having another child next year or starting a new business in 1995.

A status bar along the top of the screen gives you easy access to tax help, forms, and itemizations. Clicking on boldface hypertext words within interview questions or tax instructions produces a help window with further explanations. However, I found that the line-by-line IRS instructions that are supposed to be a button-click away were inaccessible; the IRS Instructions button was dimmed out and inoperable.

Tax Planner doesn't actually prepare Form 1040; the program is designed strictly to provide an overview of your taxes. Owners of MacInTax (which is also reviewed in this issue) don't really need Tax Planner; they can make the same kind of projections by creating alternative tax returns with MacInTax itself. Furthermore, Tax Planner doesn't account for every variable affecting your taxes and doesn't support every form. It doesn't compute the Self-Employed Health Insurance deduction or Earned Income Credit, for example.

Saving on Your Taxes

MacInTax Tax Savings Guide is an even simpler, more straightforward product. Really, it's just a collection of well-written, fully indexed tax tips and suggestions designed to help you better understand your tax return and reduce your tax liability—legally, of course. The program doesn't perform any calculation or form-preparation tasks; it just doles out advice.

You begin mining for money-saving tax tips by clicking on the Criteria button. This presents you with 23 questions about your tax situation. The questions cover issues such as your investments, marital status, self-employment income, and so on. When you've checked off the answers that apply, the program sorts through its database of tax tips and provides you with a list of all the strategies you may be able to use, based on your tax profile. You can revise your answers to the criteria questions at any time to produce a new list of tax tips based on a different profile.

Alternatively, you can view tips by category or by searching for a specific text string within the title or text of any tip. The latter feature is particularly useful. You can type in a word, such as *children* or *moving* and get a list of the tips that contain those words.

File Edit Help Tools Window

Numeric Input Field

Projection 1 / Summary(1)

Alternative 1 - Summary

Description | Starting new business in 1994

Name Horace Abernathy | SSN 399 23 9921 | 5-Year Cost 104,075

	%	(a) 1993	(b) 1994	(c) 1995	(d) 1996	(e) 1997
1 Status Exempts Elderly/Blind						
2 Taxable Wages, Salaries	4	56,000	58,240	60,570	62,993	65,513
3 Interest, Dividends	0	5,000	5,000	5,000	5,000	5,000
4 Bus. and Farm Income or (Loss)						
5 Capital Gains or (Losses)						
6 Rents, Royalties, Partnerships	3	15,000	15,450	15,913	16,390	16,882
7 Other Income or (Loss)						
8 Total Income		76,000	78,690	81,483	84,383	87,395
9 Adjustments to Income						
10 Adjusted Gross Income		76,000	78,690	81,483	84,383	87,395
11 Itemized or Standard Deduction						
12 Exemptions						
13 Taxable Income		76,000	78,690	81,483	84,383	87,395
14 Tax Computation		19,082	19,916	20,782	21,681	22,614
15 Credits						
16 Net Regular Tax		19,082	19,916	20,782	21,681	22,614
17 Other Taxes						
18 Total Tax Liability		19,082	19,916	20,782	21,681	22,614
19 Payments	4	7,800	8,112	8,436	8,773	9,124
20 Balance Due or (Refund)		11,282	11,804	12,346	12,908	13,490
21 Tax Bracket (%)						

Looking into the Future MacInTax Tax Planner projects your tax liability five years into the future, based on your current tax data. The columnar Summary view shown here displays the projected tax scenario for each year through 1997.

Double-clicking on the titles of the program's suggested strategies opens the tax tips themselves, which are presented in a window that imitates a yellow legal pad. If you're having a little difficulty understanding a tip—and you might, since some of the strategies have a disturbingly IRS-ish tone to them—you can click on the Examples button to see how the tip applies in an actual scenario. I found the examples to be the most helpful component of the program.

Though Tax Savings Guide is strong on content, it's weak in form. You can't copy and paste into another program, you can't export the data as a text file, and incredibly, you can't even print. In fact the program's menus contain exactly one command: Quit. Also, there are a few irksome Macintosh-interface violations; a highlighted button in the Tax Index can't be activated with the return or enter key, for example.

While both of these programs provide some helpful guidance, neither is as generally useful (or as wise an investment) as MacInTax, the program that inspired them.

—JOSEPH SCHORR

MacInTax Tax Savings Guide

Employee Business Expenses

Deductible Car Expenses

In calculating the amount of car expenses under the actual cost method, all operating costs and a ratable portion of the car's purchase price are deductible. Operating expenses include maintenance and repairs, gas and oil, tires, insurance, registration fees and a portion of sales tax paid on the purchase of a car during the year. Also deductible are parking costs and toll charges. The purchase price of the car is recovered through depreciation expense. This calculation is based on the purchase price of the car, the year placed in service and the percentage of business miles to total miles. Typically, if the taxpayer has an older car with significant repair and maintenance, or high insurance costs, the actual expense calculation will yield a higher deduction than the standard allowance.

Index | Example | Strategy

Need Some Advice? Each legal-pad–like screen in MacInTax Tax Savings Guide is filled with advice and explanations on various tax-related topics. Clicking on the Index button allows you to search for tips by subject or text string.

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Showplace 2.0

3-D Modeler

PROS: Improved access to MacRenderMan functions; plug-in modeling tools. **CONS:** Still not a comprehensive RenderMan interface; hit-and-miss documentation. **COMPANY:** Pixar (510/236-4000). **LIST PRICE:** On disk $695; on CD $495.

MW ★★★★

IF A PROGRAM CAN BE SAID TO HAVE had an identity crisis, Showplace 1.0 was it. Neither a comprehensive interface for MacRenderMan nor a full-fledged 3-D modeler, Showplace lacked focus and a sense of purpose.

Showplace 2.0 has matured from a simple scene assembler into an adequate entry-level modeler suitable for illustration and other graphic arts applications. The addition of Glimpse, a separate utility for editing the material effects applied to objects, finally gives Showplace decent control of MacRenderMan's functions and provides MacRenderMan with the usable interface it sorely needed. And, after years of being bundled together, Showplace and MacRenderMan are now in one package.

Plug-ins, short routines automatically incorporated into the main program at launch, are the source of Showplace's new modeling prowess. The program comes with 18 plug-ins, of which 9 produce simple objects such as cubes, cones, and spheres, as well as more complex toroidal and parabolic shapes. Also included are plug-ins for lathing objects, building stairs, producing blinds and curtains, generating fractal-based terrains, simulating fireworks, and importing objects from Adobe Illustrator and 3-D models in DXF format.

The Type Gizmo plug-in produces extruded text from TrueType and PostScript Type 1 fonts. It's a big improvement over version 1.0's awkward reliance on importing text objects from the separate LabelMaker utility. Unfortunately, my copy of Type Gizmo had difficulty recognizing font outlines. Pixar attributes the problem to old System 7.0 files.

All plug-ins have dialog boxes for specifying dimensions and other characteristics. Unfortunately, the only way to invoke a plug-in is through the Object menu. At the very least, the basic geometric shapes, the lathe, and Type Gizmo should be added to the object palette for easy access. I also quibble with locating the file translators in the Object menu instead of the File menu, where it's more logical to find input-output functions. Still, plug-ins are a great addition that provide for future expansion.

The second major improvement in Showplace 2.0 is Glimpse, a separate utility that replaces some LabelMaker functions and adds the ability to create and edit Looks, the textures and surface effects that Showplace can ascribe to 3-D objects. Looks are built from Shaders, the mathematical descriptions MacRenderMan uses to simulate real-world materials on an object's surfaces. However, Looks can also incorporate text elements and bitmaps, making them more versatile than straight Shaders.

Showplace's Palettes You can move objects, apply Looks, add lighting, and photograph the scene with these palettes. Quick preview renderings help you make the right decisions.

With Glimpse you can open an instance (or copy) of a Look; use sliders to alter such material attributes as color, glow, reflectivity, and bumpiness (relief); and save it as a new instance of that Look. As you change slider settings, the Glimpse window continually renders a preview of the effects, so you can try several settings in quick succession without waiting for an image to develop. Glimpse also lets you import bitmapped images to incorporate into a Look, use a gray-scale image to finely calibrate such effects as transparency, and create text to produce opaque labels or see-through decals.

Glimpse has an advanced mode that lets you manipulate Shader parameters more precisely. Glimpse does not provide direct access to the underlying Shader code but permits sufficient modification of Shader parameters that even the most demanding users will likely be satisfied.

Back in Showplace, the versatile lighting and camera palettes remain unchanged. The cumbersome Librarian utility has been replaced by standard Browser dialogs for adding Looks to the surfaces palette and Showplace's many clip objects to the scene. Other collections, Looks, and Shaders are available from Pixar and The Valis Group.

MacRenderMan's photo-realistic renderer is now Showplace's native renderer, and little more need be said. It's simply one of the best renderers around, and Pixar has an Oscar to prove it. A three-node version of NetRenderMan is included, so small studios can jump to distributed rendering right away.

The updated Showplace manual does an adequate job but gives no background on plug-ins. The Glimpse booklet is informative and amusing. Gone, however, is the MacRenderMan manual. True, it was arcane, but if you wanted to roll up your sleeves and tinker with Shaders, the basic information was there.

Showplace 2.0 has acquired basic modeling skills and offers significantly improved access to MacRenderMan, which is probably the best reason to buy Showplace in the first place. It's a good thing programs don't have personalities—Showplace could develop a complex if it realized people were mostly buying it for its Looks.—CARLOS DOMINGO MARTINEZ

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	V:50-90Hz	V:50-90Hz	V:50-90Hz	V:50-90Hz	V:40-100Hz
Macintosh Compatibility	640x480/67Hz 832x624/75Hz	640x480/67Hz 832x624/75Hz	640x480/67Hz 832x624/75Hz	640x480/67Hz 832x624/75Hz	640x480/67Hz 832x624/75Hz 1152x870/75Hz
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End users circle 38 on reader service card

Dealers circle 39 on reader service card

Two RAID Drives

Storage

PLI 2.4 GB MiniArray

PROS: Speedy, quiet, and smooth performance on most Macs. **CONS:** Expensive; QuickSCSI board sensitive to minor SCSI problems; awkward internal-termination DIP switches; skimpy manual. **COMPANY:** PLI (510/657-2211). **LIST PRICE:** $4815; internal model for Quadra 900 or 950 $4377.

MW ★★★

SledgeHammer2000FMF

PROS: Fast, especially on a Quadra 900 or 950; easy installation; good manuals. **CONS:** Somewhat noisy when accessing data. **COMPANY:** FWB (415/474-8055). **LIST PRICE:** $3179; internal model for Quadra 900 or 950 $2979, SledgeHammer2000FMF for NuBus $3699.

MW ★★★★

A FEW YEARS AGO, A 100MB HARD drive was more than enough for most Macintosh owners. But the rapid growth of color prepress and multimedia work on the latest generation of high-speed Macs has resulted in a need for fast, reliable storage that can process huge chunks of data.

RAID stands for Redundant Array of Inexpensive Drives, which describes a drive assembly that consists of two or more smaller mechanisms. A RAID drive offers two performance enhancements. The first is the ability to recognize multiple drives as a single large mechanism. By transferring and accessing data from two drives at the same time, your Mac gets a healthy performance boost. In addition, you can set up some arrays for disk mirroring. This process lets your Mac send the same data to two drives simultaneously. You get an instant backup of your data, so if one drive fails, the other remains in service with your files intact.

FWB SledgeHammer

The FWB array is tall and squat. Its two drives are based on 1GB DEC mechanisms, for 2GB total capacity. Although generally quiet, the FWB array can be somewhat noisy when accessing data.

Setting up the SledgeHammer array is a snap. The rear of the case has four SCSI jacks and a separate recessed SCSI ID selector switch for each drive. The drives are preformatted when they arrive, so you can be up and running in just a few minutes. If you want to reformat the SledgeHammer, however, be prepared to spend about 45 minutes formatting and testing each drive mechanism.

The well-written manual takes you step-by-step through the installation process. Each drive can be hooked up separately, of course, but for maximum throughput you'll want to use the supplied FWB Hard Disk ToolKit Pro software to initialize them for drive striping. This process takes just a few minutes and sets up a partition on both drives to allow data to be read from and written to both drives simultaneously, resulting in maximum data throughput.

The SledgeHammer is really in its element when used with a Quadra 900 or 950. You hook one drive in the FWB array to the Quadra's internal SCSI port, the other to the external SCSI port. This double connection scheme allows the FWB array to exploit the dual bus architecture of the 900 and 950. As a result, the FWB achieves a slightly better performance rating (see "How They Compare") than the PLI MiniArray. To help boost performance on other Macintosh models, FWB also sells the SledgeHammer array with its SCSI JackHammer accelerator board (which was not tested for this review).

PLI 2.4 GB MiniArray

The PLI MiniArray's higher price tag buys you 20 percent more capacity. It's made up of two Maxtor 1.2GB mechanisms, for a total capacity of 2.4GB. In daily operation the PLI array was quiet, even when the drives were hard at work.

Installation of the MiniArray is a two-step process. First you install the QuickSCSI card in your Mac's NuBus slot. Then you hook PLI's proprietary 25-to-50-pin SCSI cable to the MiniArray, and you can attach a cable from the second SCSI jack to other storage devices on your SCSI chain. The MiniArray arrives formatted and tested. If you ever need to reformat, the entire process will take about an hour. PLI's formatting software recognizes the drive mechanisms as a single unit with a single SCSI ID number.

The case betrays little evidence of containing two drives, except for being about 2 inches wider and 3 inches longer than a standard hard drive case and having two drive-activity lights. The rear of the case has a single pair of 50-pin SCSI jacks and a single convenient, switchable SCSI ID selector. The drive is internally terminated, and it's controlled by a confusing setup of three assemblies, each containing ten DIP switches. Switching termination on or off requires moving *all* the DIP switches up or down.

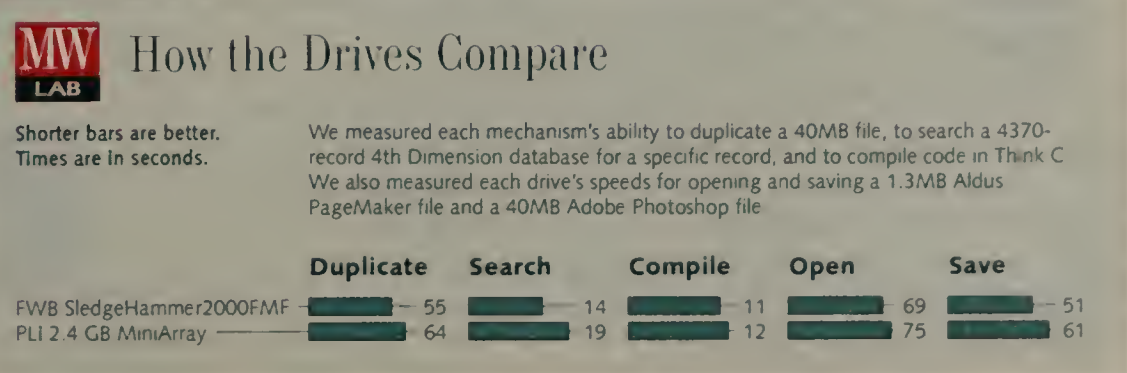
The QuickSCSI accelerator card is most effective with a slower Mac. Also, I found the card a bit sensitive to the presence of a complex SCSI chain (it won't accept a scanner or a CD-ROM, for example). After enduring some unexplained SCSI bus errors, I ended up moving all of my external drives other than the MiniArray to my Mac's regular SCSI chain. Once that was done, performance was flawless. PLI technical support explains that the QuickSCSI card works best with high-quality SCSI cables.

The manual, though providing the basics you need to get up and running, is a bit skimpy on step-by-step instructions, illustrations, and troubleshooting tips. PLI technical support gets high marks, however.

The Envelope, Please

Both drives are well engineered and, in use, betray no evidence of being anything other than single large hard drives.

The PLI MiniArray is fast, slick, and elegant, and it worked beautifully during my tests once it was set up properly. But the FWB SledgeHammer's speed and more flexible installation options impressed me. Even with the optional SCSI JackHammer card, the SledgeHammer is considerably cheaper than the PLI product. Unless you need the extra 400MB capacity, I recommend the FWB SledgeHammer over the PLI MiniArray in this head-to-head matchup.—GENE STEINBERG



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Circle 56 on reader service card

New Charting Software

Charting Software

Cricket Graph III 1.5

PROS: Simple operation; pleasant default-chart aesthetics; good math-recoding capabilities. **CONS:** No 3-D chart types; limited import/export. **COMPANY:** Computer Associates International (516/342-6000). **LIST PRICE:** $129.

MW ★★★

DeltaGraph Pro 3

PROS: Outline and sorting views for presentation design; 54 chart types; QuickTime support. **CONS:** A few confusing icons and commands. **COMPANY:** DeltaPoint (408/648-4000). **LIST PRICE:** $195.

MW ★★★★

THE MACINTOSH CHARTING SOFTware business must be a tough way to earn a living. The big problem is that the universally accepted Mac spreadsheet, Microsoft Excel, persistently offers incremental improvements in its charting functions, so chart-software vendors have to offer more every year to justify their software programs.

Consider DeltaGraph Pro 3's chart gallery. Earlier versions of DeltaGraph already included a variety of chart types, but now there are boxplots, open/high/low/close plots, specialty histograms, and several kinds of percent charts and vector charts. Some of these types have previously been available only in statistical software. Pictographs (*USA Today*–style bar charts made of coins and barrels and so forth) are now available and easy to make. There's even a new Chart Advisor function that suggests the appropriate display for your data. It's now possible to open several DeltaGraph documents at once and to drag and drop chart objects between documents to produce even more chart types, if necessary, by hybridization.

In contrast, Cricket Graph, nearly the oldest living charting program for the Mac, has survived on a basic set of chart types. Version 1.5 adds overlays, customizable tables, and a new histogram chart type, but these still give Cricket Graph a fairly modest list. Simplicity has its own attractions, though. For example, for years SPSS, the giant, industry-standard statistical package, has used a customized version of Cricket Graph as its charting module, probably because its modest set of choices and excellent, much-refined documentation (and excellent online help) make Cricket Graph a snap to master.

Special Effects

Although Cricket Graph 1.5 can handle blends in document windows and save documents in commented PICT and EPS format, Computer Associates really expects you to do your fancy graphics work in Cricket Draw III, so documents can be saved from Cricket Graph in Cricket Draw format and individual graph objects can be exchanged. The drawback is that if you don't buy Cricket Draw, your range of artistic graphics effects is limited compared with those in DeltaGraph (or Aldus Persuasion or Microsoft PowerPoint).

DeltaGraph has packed all sorts of effects into the charting program itself. Color handling, for example, has been greatly improved over earlier versions—it's now easy to do fancy background blends and shading effects. DeltaGraph now includes good-looking Pantone-designed color palettes that improve the appearance of slides and printed color output; you can also design your own custom palettes.

The Works If you can't find your favorite chart type in DeltaGraph's list, buy a box of crayons. Besides this set of choices, DeltaGraph Pro 3 includes tools for organizing chart-based presentations.

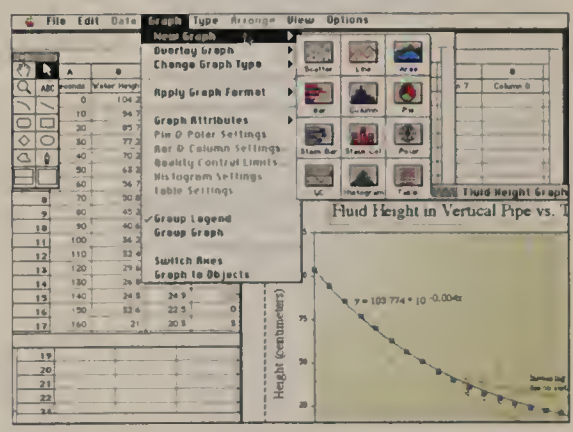
The math capabilities of the two programs are roughly comparable in practice. In both you can do curve fitting without much fuss (DeltaGraph has more options). In both you can transform columns of data to new columns by using the fairly complete list of built-in functions (Cricket's implementation is a bit easier to use).

Comparison Chart

DeltaGraph offers outliner and sorter views of chart sets, in which you can juggle the order of charts using thumbnails. Your charts appear as little slides, 12 to a page, and you can select and move slides with the mouse. You can also select from a dozen transition styles, from fades to explosions. There is, regrettably, no such slide-show–management capability in Cricket Graph.

DeltaGraph imports data directly from Excel and other applications and maintains hot links to the data. Cricket Graph requires that you communicate with your existing spreadsheet data, using tabbed text files as the interchange medium. DeltaGraph also implements enough AppleScript to automate export of charts to Aldus PageMaker documents. Cricket Graph supports publish and subscribe under System 7, but it's reasonable to expect more help in automating common user activities. DeltaGraph includes a large library of page-layout templates for professional-looking charting.

Becoming familiar with DeltaGraph's special features by doing lots of presentations is in fact the key to using the program. A command bar speeds up operations with practice. A slight minus is that while DeltaGraph's internal linkage between data and charts is useful, it's still somewhat disconcerting that your data table closes when you close the related chart. Cricket Graph is somewhat better than DeltaGraph at doing things the way you expect them to be done (the drawing tools are just like MacDraw's), and its relatively limited feature set makes it significantly easier to learn.



Pick One Although you can create overlay charts with Cricket Graph III, this menu basically defines your options. Charting is intuitive, but the program is missing some popular types.

Thus, if you do a few charts every month or so, you may prefer Cricket Graph over DeltaGraph Pro because it's basic and foolproof—it produces cleaner charts than Excel with little effort. On the other hand, if you're doing a show of 20 slides to your city council, you need DeltaGraph. At its new lower price, DeltaGraph Pro 3 is the undisputed best feature-for-feature value in Macintosh charting.—CHARLES SEITER

Three Utilities

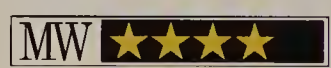
File-Transfer and Translation Utilities

AccessPC 3.0

PROS: Translates most word processor and some database formats; supports removable drives. **CONS:** Does not translate graphics formats; some translations result in data loss; predefined file-type database is skimpy. **COMPANY:** Insignia Solutions (415/694-7600). **LIST PRICE:** $129.95.

DOS Mounter Plus 4.0

PROS: Works with floppies, removable drives, and network volumes; supports wild cards in DOS extensions. **CONS:** SCSI Probe 3.5 conflict. **COMPANY:** Dayna Communications (801/269-7200). **LIST PRICE:** $100.



MacLinkPlus/ Translators Pro 7.5

PROS: Options for text, data, and some graphics; translates while opening file in some applications. **CONS:** Predefined file-type database has only one entry; doesn't support removable drives; runs slowly. **COMPANY:** DataViz (203/268-0030). **LIST PRICE:** $149.

WITH APPLE OFFERING A PC-ON-a-card, promoting a Windows emulator for the PowerPC Macs, and offering Macintosh PC Exchange to let PowerBooks and other Macs read DOS disks, Insignia Solutions, DataViz, and Dayna Communications have all revised their software. Apple hasn't updated Macintosh PC Exchange (a version of Insignia's AccessPC with a slicker interface that does not run under System 6) since our last review (*Reviews, Macworld*, October 1992); it retains its three-star rating.

AccessPC

Insignia's AccessPC 3.0 now includes Mastersoft's Word For Word Macintosh translators, so you can double-click on a file with an obscure file format like WordStar, and AccessPC translates it to Microsoft Word before launching Word. The translators cover almost every conceivable word processor, including many rarely used, like MultiMate and Wang. There are also a few data formats, like Lotus 1-2-3 Release 3 and earlier, dBase, and Microsoft Works. But if you deal with graphics, you'll have to look elsewhere.

I was not impressed with the quality of some of the translations. For example, AccessPC garbled Lotus 1-2-3 when it tried to open the file, but when using Excel, the 1-2-3 file opened just fine. I also had "Unrecoverable disk errors" when translating Rich Text Format and Lotus Ami Pro 2.0 files. With WordPerfect 5.1 files, the information for embedded graphics and fonts was lost after translating, although table formatting was retained. Another oddity was that Word For Word translated Windows Mac Excel 4.0 files to Excel 3.0 files. (The translation also stripped out the embedded chart and garbled the data.) WordPerfect 4.2 and WordStar 4.0 and 6.0 translation went fine.

Like other PC disk mounters, AccessPC has a database of DOS extensions, but it has very few predefined formats (basically, just Word and 1-2-3), and the installation routine doesn't scan your hard drive to see what applications you have so it can add to the database. Instead, you must do the work.

I liked AccessPC 2.0 a lot better. It did well what it promised to do. Version 3.0 does a whole new thing poorly. If you don't use the Word For Word translation, you'll like AccessPC's ability to work with removable drives. But Dayna's DOS Mounter Plus also has that capability.

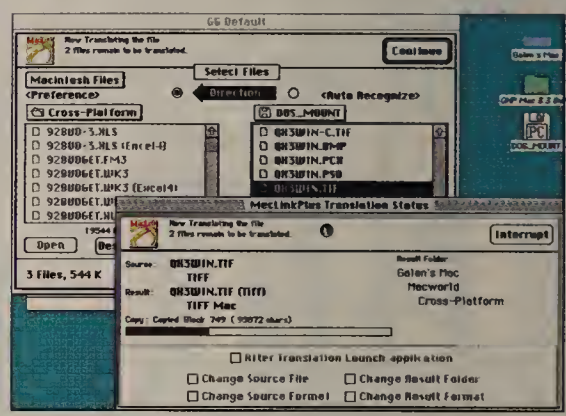
DOS Mounter Plus

DOS Mounter Plus 4.0 essentially consolidates the NetMounter utility (for accessing files over a cross-platform network) with DOS Mounter (which supports both floppies and removable media). It's also the only program to support wild cards in DOS extensions.

DOS Mounter Plus's file-type database is skimpy but not as minimal as AccessPC's. It includes Word, Excel (spreadsheets and charts), 1-2-3, PageMaker 4.0, Rich Text Format, and CGM, DXF, and IGS graphics formats. DOS Mounter Plus 4.0 runs faster than the older version, but occasionally there is a noticeable drag when loading a disk or copying a file.

I found a conflict with SCSIProbe 3.5, a control panel that mounts SCSI devices (available as shareware from Robert Pollack and SyQuest Technology). Every time I tried to throw a PC disk in the Trash, I would get an error message saying the disk could not be put away. Then the floppy drive wouldn't recognize any disk. This problem did not occur with Golden Triangle's DiskMaker SCSI mounter.

DOS Mounter Plus does not include file translation, which is no big deal if you use mainstream DOS and Windows programs, since mainstream Mac programs directly import most PC formats. If you're using programs that don't import, or if your PC files are in archaic formats like WordStar, you'll need DataViz's MacLinkPlus/Translators Pro.



Smart Translation DataViz's MacLinkPlus/Translators Pro translates between many format types, and its autorecognition feature is highly accurate, relying on a look at the file's contents, not just at its DOS extension or Mac file type.

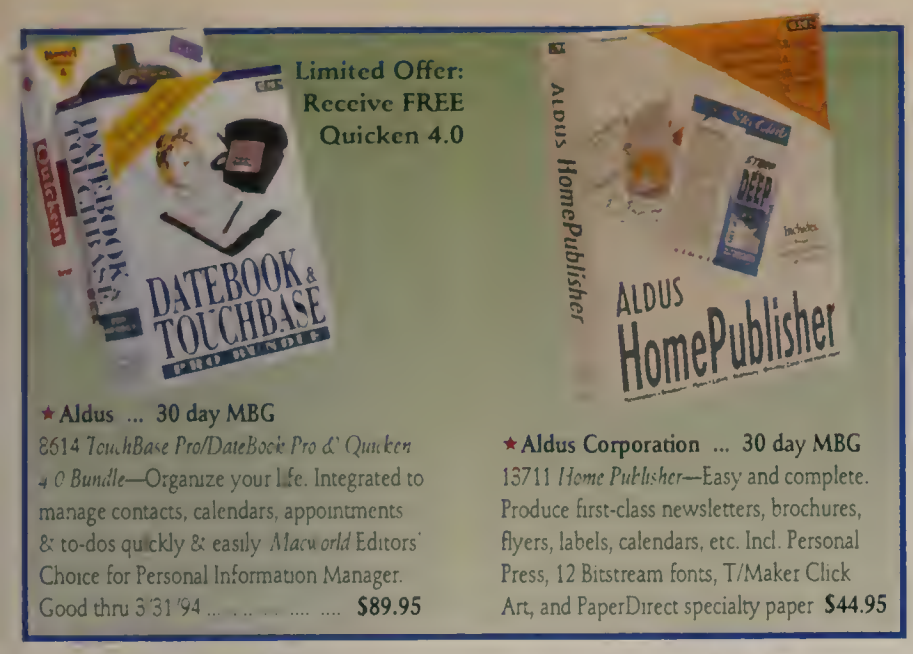
MacLinkPlus/Translators Pro

DataViz has split MacLinkPlus/PC into several products. The original $199 MacLinkPlus/PC lets you cable together a PC and a Mac to exchange data. The $149 MacLinkPlus/Translators Pro includes a disk-mounting utility—the same core utility used in AccessPC and Macintosh PC Exchange—and about twice as many translators as AccessPC offers.

Oddly, the version of Macintosh PC Exchange bundled with MacLinkPlus runs slowly—slower than Apple's version and even slower than DOS Mounter Plus. And PC Exchange's database of file types contains only one entry: text-only files, which are mapped to TeachText.

You can access MacLinkPlus translators in several ways. First, from the MacLinkPlus program itself. Second, through the Open dialog box in Word and Works (although this slows file-open operations). Third, through any program (like PageMaker) that supports Apple's XTND technology, which lets files be translated while being imported or opened. Fourth, when you double-click on a file for which there is no program associated with its file type, through Apple's Macintosh Easy Open extension, which displays a list of applications that may be able to import

continues



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12974 DeltaGraph Pro 3 ..... 79.95
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7612 QuarkXPress 3.2 ..... 589.
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Chinese or Japanese Lang Kit... *ea.* 195.
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10478 System 7.1/Font Pack Bundle ..... 62.
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2198 More After Dark 25. 2196 Bundle 39.95
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★ **Central Point ... 30 day MBG**
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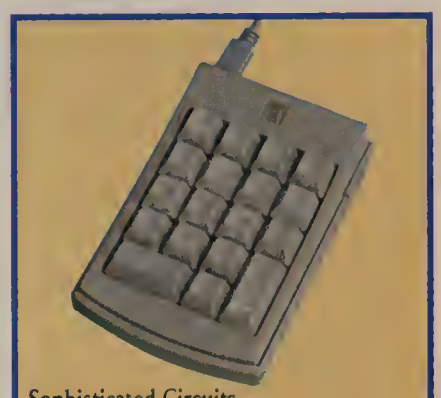

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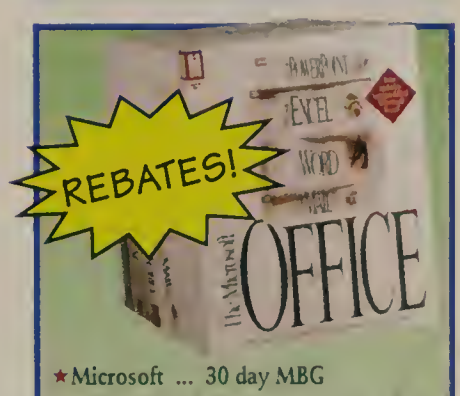

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13601 The Treehouse ..... 36.
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11052 M144I V.32bis FaxModem ..... 189.
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11696 Etherthin Mac/PB ..... 309.
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6618 VersaTerm 5.0 109. 6619 PRO 5.0 169.
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11842 Sportster 14.4 Mac & Fax ..... 229.
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14152 FaxModem VFX 14.4V for Mac..... 174.95
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1885 Stingray ADB 79.95
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Epson
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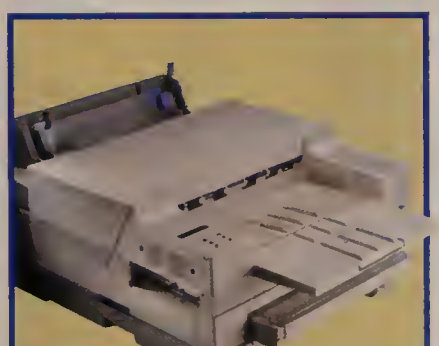

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or translate the file (AccessPC also includes this extension).

DataViz has enhanced its translation utility. You can now assign a Mac creator type for standard file types like TIFF and EPS. For example, TIFF files created by a MacLinkPlus translation can be associated with Photoshop, so if you double-click on the files, they are loaded into Photoshop. There is also an option for handling extended characters.

MacLinkPlus works well, but it's not perfect. First, it does not recognize or translate some formats: Ami Pro 2.0 or later (it supports version 1.2), CorelDraw, Lotus 1-2-3 Release 4, Photoshop, FileMaker Pro, Adobe Illustrator, and QuarkXPress. The last five of these formats are cross-platform applications for which no translation is needed beyond DataViz's adding the Mac's file and creator type to the database. (The bundled Macintosh PC Exchange can do this mapping, but it doesn't work with network volumes.) Also, some translations are limited: PCX and Windows BMP bitmap files can be translated only to Mac PICT, not to TIFF as one would often want.

Some data is lost during translation. For example, in moving from Windows Excel 3.0 or Windows Lotus 1-2-3 Release 3 format to Mac Excel 4.0 format, the embedded chart was stripped out, although Excel itself retained the chart when it directly imported the PC files. When translating Windows WordPerfect 5.2 to Word for the Mac, the embedded graphic was removed. The translation from WordStar 6.0 to Word resulted in wildly incorrect margins. MacLinkPlus doesn't know about PageMaker 5.0 on the Mac, so it uses the version 4.X creator and file type instead, which means that you can't double-click on the file to launch PageMaker 5.0.

CGM to PICT, DOS and Windows Word to Mac Word, WordStar 4.0 to Word, Rich Text Format to Word, PCX to PICT, BMP to PICT, and Ami Pro 2.0 to Word all worked without a hitch.

Making a Choice

MacLinkPlus/Translators Pro is a great option for most users, and the bundled Macintosh PC Exchange handles most users' needs. But if you need support for removable drives or network volumes, get both DOS Mounter Plus and DataViz's $109 MacLinkPlus/Easy Open Translators (no Macintosh PC Exchange bundled). And if you don't need translation, it's a toss-up between DOS Mounter Plus and Macintosh PC Exchange, with the deciding factor being your need to support media other than floppies.

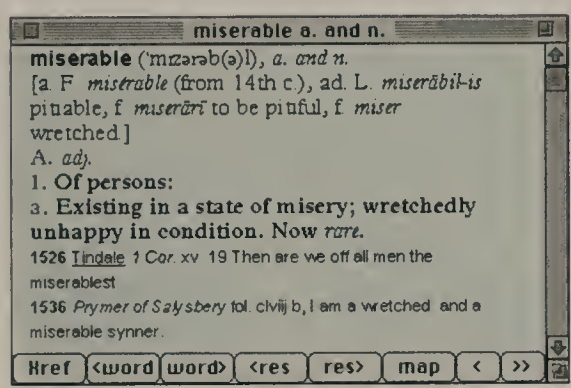
—GALEN GRUMAN

The Oxford English Dictionary

CD-ROM Reference

PROS: Twenty reference volumes on one CD-ROM; numerous search options. **CONS:** Inexcusably poor design; can't guess misspelled words; search results and some program functions are unreliable; complex searches require a form of programming; occasionally crashes; poor manual; no tech support. **COMPANY:** Oxford University Press, Electronic Publishing (212/679-7300, ext. 7370). **LIST PRICE:** $895.

THE OXFORD ENGLISH DICTIONARY (OED) contains definitions, comprehensive etymologies, and illustrative quotations (2.4 million of them) for over half a million words. The reference section is identical to that of the 20-volume print edition. Within main and subsidiary headwords, you can search for words or phrases, variant forms, Greek words, or the phonetic forms of words; within quotations, for the quotation date, author, the title of the source, or a word or phrase within the text of the quote; within etymologies, for languages, foreign words, or a word or phrase within the explanatory text; and within definitions, for any word or words.



Miserable Performance Options allow you to display different parts of an entry—etymology, definitions, and/or quotations.

Searching, however, is neither intuitive nor easy. For starters, all searches must be initiated from the Search window or the List window. In some cases it doesn't matter which one you use. In other cases, the manual recommends that you *not* use the Search window. A more difficult problem is that you get no spelling help. If it can't find a word, OED finds the closest alphabetical match, which is usually irrelevant. Equally inconvenient is the fact that some multiword headwords (such as *academic freedom*) are in one search area and some are in another, so two searches are often required simply to look up a phrase.

OED's search algorithm also has problems. A search for two (or more) words in the quotations, etymologies, definitions, or whole dictionary, for example, can give vastly different results depending on the order in which you list the words. Worse still, such multiword free-text searches frequently fail to find entries that clearly fulfill the search criteria. Wild-card searches sometimes fail to find obvious matches. But the most serious flaw is that there is no easy and reliable way to search two or more areas at once (to search for *Nahuatl* in the etymologies and *spear-thrower* in the definitions to find the entry for *atlatl*, for example). You can conduct a free-text search, but this method frequently fails to find qualifying entries (as in the search above, which fails to find *atlatl*). Or you can use the program's built-in "query language." Neither of these alternatives is acceptable.

Proper Macintosh design is seriously lacking. The scroll arrows at the tops and bottoms of scroll bars, for example, don't scroll the window; they move the highlight bar up and down. The Font Colour dialog box (which establishes the text color for the parts of each entry) uses radio buttons to open subsidiary dialog boxes rather than turn options on and off. In the Part of Speech filter, deselecting all parts of speech tells OED to search for all of them, not none of them. And the automatic addition of three-letter extensions at the ends of file names (such as Quotation.Quo) is clearly leftover DOS programming.

Some parts of the program are poorly designed, and other parts don't work reliably. If you try to select two or more items in the List window, sometimes you get what you want, sometimes you get less, and sometimes you get more. Occasionally the program chokes on a word (such as *tongue*, whose entry I have yet to see) and simply quits. And depending on your printer, you may have no luck printing entries. When you copy an entry to your word processor, OED strips the copied entry of all formatting.

Finally, there's the issue of help. The manual is incomplete, often unclear, and sometimes inaccurate. Worse, the number you call for technical support leads, in fact, to the marketing department, and I have yet to hear from them. The most attractive aspect is the price. At $895, the difference between it and the print edition (at $2750) is breathtaking. But for software this expensive, the flaws, omissions, and unreliability are simply too great.—ROBERT C. ECKHARDT

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MACWORLD MW EDITORS' CHOICE

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Morph 2.0

Warping and Morphing Software

PROS: Easy to use; beautifully designed; delightful new features. **CONS:** Manual nearly useless for understanding new features; a few maddening bugs. **COMPANY:** Gryphon Software Corporation (619/454-6836). **LIST PRICE:** $239.

MW ★★★★

MORPH 1.0 WAS FAST, INEXPENSIVE, and simple to use. And it morphed very well indeed (see *Reviews*, November 1992). You could feed it two pictures, one of your crotchety neighbor and one of Jiminy Cricket, say, and Morph would produce a QuickTime movie in which the features of the first person dissolved—no, *melted*—into the features of the second.

Morph 1.0 worked only with still images. Your dream of producing the next "Quantum Leap" or "Deep Space Nine" episode, in which characters cheerfully dissolve into other characters while walking, had to remain unfulfilled.

You can start dreaming again. Morph 2.0 can indeed meld one QuickTime clip into another. Here's how it works.

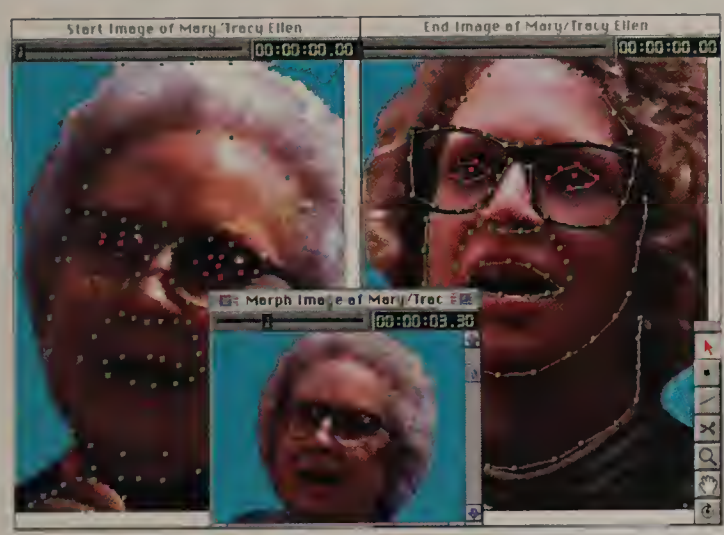
When you morph still images, you plant dozens of yellow dots on the starting picture at key positions—the eyeballs, the hairline, top of the head, and so on. As you go, yellow dots appear on the ending picture. You drag these other dots onto the corresponding facial features. It's tedious, but simple. Then, after the Mac computes for half an hour or so, your morph movie is complete.

When you morph *moving* images, however, you don't place dots merely on the beginning and ending images. You must adjust those dots so that they hug the corresponding features on *every* frame of *both* movies. Fortunately, Morph does a superb job of "tweening" the dots' positions, so you really only need to tweak dot positions on every tenth frame or so. Still, the more dots, the more professional the final morph. Making a moving morph is, therefore, even more tedious-but-simple.

More improvements: Morph can compile your movies in the background. It can now create wild warps, in which you can distort your loved ones in any way imaginable. You can create caricatures, in which the most prominent features of your subject become automatically exaggerated. And you can, at long last, select and adjust *groups* of points at one time.

The program is far less picky about the beginning and ending images you feed it; they no longer have to be the same size and resolution. Similarly QuickTime movies don't have to be the same number of frames. The program scales them to fit each other. Unfortunately, this feature means you can never find the same spot in each movie; frame 35 (and, let's say, 50 percent on the scroll bar) for movie A may correspond to frame 12 (and 80 percent on the scroll bar) for movie B. The programmer says there was a "raucous in-house debate" about this nonmatching scroll-bar issue. I say the wrong people won.

Bigger problem: the hot new features are discussed almost incoherently in the manual. The critical information left out could fill a *second* book—and should. You can't possibly do a moving morph of even moderate complexity without phoning the tech-support staff (which is, fortunately, excellent). (Why doesn't it occur to software companies to spend a little money, once, on a well-written manual, to save thousands on tech support forever after?) There are bugs and incompatibilities, too; at one point, my tool palette wouldn't work until the tech-support guy talked me through a ResEdit hack to fix the program.



Who's That Girl? If you're trying to morph two movies into one (the right and left images shown here), it helps if the backgrounds and motion are similar. You can monitor your progress in the Morph window (center).

Even so, Morph 2.0 is light-years easier, faster, and more enjoyable than its rival, Elastic Reality (ASDG; see *Reviews*, February 1994). Elastic Reality does offer a powerful feature Morph misses: it lets you pass one picture element (say, a limb) cleanly in front of another. Otherwise, if your FX plans include anything shy of *Terminator 3*, using Morph is as painless as morphing gets.—DAVID POGUE

SITcomm 1.0

Telecommunications Software

PROS: Inexpensive; on-the-fly decompression and compression of downloaded and uploaded files; simple user interface. **CONS:** Lacks true scripting; has limited protocol options. **COMPANY:** Aladdin Systems (408/761-6200). **LIST PRICE:** $120.

MW ★★★

SINCE THE DAYS OF THE HAYES Smartmodem, telecommunications has been steeped in arcana. Even on the Mac, telecommunications software has been unintuitive, burying users in deeply nested dialog boxes to do something as simple as connect to a bulletin board system (BBS). With Aladdin's SITcomm, I hoped for a straightforward program that would hide the gory details (or at least organize them palatably) yet support my need for access to several types of BBSs and online services. While SITcomm is a good step in the right direction, it makes some compromises.

The good news is that it's fairly easy to set up and use SITcomm. When creating a log-in script (which automates log-in procedures by entering your ID and password), SITcomm lets you choose from an extensive list of scripts—everything from CompuServe to Unix-based mainframes. CompuServe, MCI Mail, GEnie, EasyLink, and Dow Jones are all there, as are several popular BBSs like TBBS, Telefinder, and FirstClass.

You can have any number of these log-in scripts in the SITcomm address book, including services whose communications and protocol settings differ from one another. One of SITcomm's nicest features is the ability to make a log-in script automatic, so that it runs as soon as you pick it from your address book.

To change the arcane settings (such as flow control) for a particular service, you access a series of dialog boxes from a list of icons, which I find easier to use than pull-down menus. If you use a predefined log-in script, you only need to check that the right modem driver, telecommunications port, and telecommunications speed are selected; the other options are set to work with the service or BBS in question.

A word of advice: make sure you set Preferences and Default Tool Settings first, since they carry over. For example, if you have only a 2400-bps modem, set that in Default Tool Settings so all future

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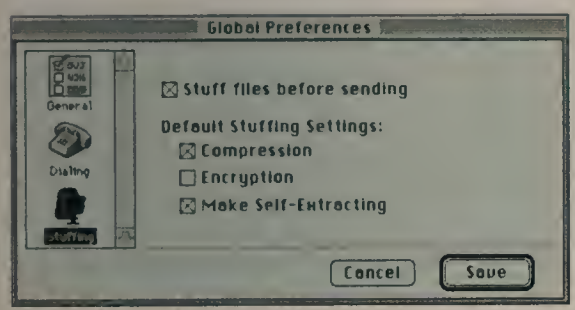
log-ins are set at 2400 bps; that way you don't need to modify the setting each time you create a log-in script.

SITcomm includes a version of StuffIt that compresses files (into your choice of regular or self-extracting format) before you upload them, which makes for faster transfer time and lower online costs. It also decompresses files from any of several formats, including StuffIt, Compact Pro, AppleLink, and BinHex. This is a wonderful option.

The control-panel–like interface puts all the settings in direct view—no searching through pull-down menus—while not getting in the way of the terminal window where the real action is: your online session. Though a bit antiseptic, the interface is really functional and simple to use.



SITcomm On-the-fly compression when uploading files could save on access costs.

SITcomm clearly has a solid base, but I need more. For example, SITcomm's Xmodem, Ymodem, Zmodem, and Kermit protocols cover most needs but not all. I'd like to use the QuickB protocol (not available in SITcomm) on CompuServe rather than Xmodem—QuickB is faster. Also, SITcomm's default log-in for MCI Mail does not work correctly if you dial the toll-free access number. (A fix is promised for the next version.)

This leads me to one of SITcomm's most significant omissions: real scripting. I'd like to log in to a service or BBS and have SITcomm record the actions and create a script that I can then modify—or just use as is. Automated log-in is nice, but real scripting would let me handle services that SITcomm now can't handle automatically (such as Wildcat or MCI Mail's 800 access), as well as automate some operations, like combining log-in with moving to an area of the service that I use routinely.

Make no mistake: SITcomm is a good product that will do well for people who use just one or two services. But the more services you use or the more customization you want of your online sessions, the more you'll wish Aladdin had gone a bit further in developing SITcomm. The technical-support staff (which was professional and helpful) says a new version is in the works. I'm looking forward to it.—GALEN GRUMAN

Passport Producer Pro 1.0

Multimedia Authoring Tool

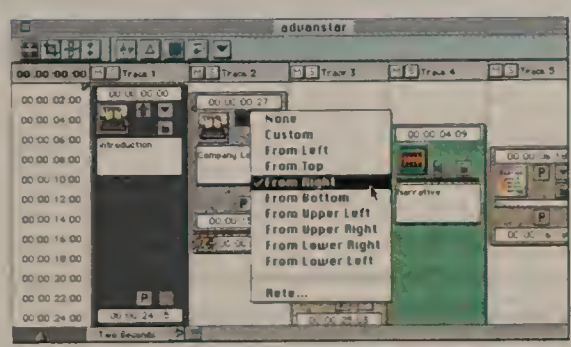
PROS: Powerful interactivity controls; direct support for external devices such as laser discs and tape decks; includes two CDs of clip media. **CONS:** Expensive; path animation limited to entrances and exits. **COMPANY:** Passport Designs (415/726-0280). **LIST PRICE:** $995.

MW ★★★

PASSPORT PRODUCER, AN IMPRESSIVE multimedia-integration package first introduced in 1992, has been replaced with Passport Producer Pro. The good news is that this upgrade includes a multitude of interactivity and path-animation tools not in the original version. The bad news is that these improvements have jacked up the price by about $500. (The original Passport Producer is still being distributed but only through educational markets.)

Producer Pro is a time-based production tool. It allows you to synchronize graphics, sounds, movies, MIDI sequences, and other digital information into a cohesive presentation. The main interface is the Cue Sheet—a vertical time line on which each media element (or cue) included in your presentation is represented as an individual tile. You can adjust the entrance, exit, and duration of elements by dragging their corresponding tiles into place on the Cue Sheet. The time-line approach allows for very precise synchronization of cues.

The intuitive interface also includes two floating palettes. The media palette contains icons representing PICT or TIFF graphics, PICS animations, QuickTime movies, AIFF sounds, and so on. To add a new element to a presentation, you drag the appropriate icon from the palette onto the Cue Sheet and then, from the Open dialog box, select the file you want to integrate into the presentation.



On the Right Path In the Pro version of Passport Producer, you can make objects fly into view along a path. A pop-up menu on each cue tile allows you to set the direction of the path and the rate at which the object will move.

The control palette contains icons representing the various cues to control interactivity or operate external devices such as CD-ROM drives, laser disc players, and tape decks. By adding these cues to the Cue Sheet you can summon a single frame or a sequence of frames from a supported device.

Once you've added a cue, you can apply one of more than 40 different transitions to control its entrance and exit. You can also make objects enter and exit along a path you define and assign each object a position against the Stage—the background against which the presentation will play. On a IIci with 17MB of RAM, I could combine only a few effects without seriously degrading performance. Passport suggests you allocate at least 8MB to Producer Pro (though it can run on as little as 4MB).

While the original Producer lacked the tools to build interactive presentations, the Pro version has a full arsenal. For example, you can add action cues to make a presentation loop or jump to a specific location, or button cues to shift to a new sequence or even into a new presentation.

Several other significant improvements have earned the program its pro status. A text-cue feature allows you to create text objects with drop shadows and add them to a presentation. Objects can fly in and out of a scene either in a straight line or along a custom path. (Unfortunately, you can't move objects unless they enter or exit the scene.) New tools have been added for scaling and positioning groups of objects on Stage. And you get two CD-ROM discs with a generous supply of graphics, movies, and sounds you can use to build presentations.

Producer also includes built-in editors that allow you to cut and paste movie frames, crop graphics, create PowerPoint-like slides, and record sounds. Alternatively, you can configure the program to open your own editing programs from within Producer for last-minute touch-ups of your media files.

You can play back a finished Producer presentation on your Mac screen, export the presentation as a QuickTime movie, or if your Mac is equipped with an RGB-to-NTSC converter and connected to a VCR, print the presentation to videotape.

Overall, Producer is a superb—albeit expensive—media-integration package that makes assembling even complex presentations surprisingly easy.

—JOSEPH SCHORR

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ExpensePlus 1.0.1

Expense Report Software

PROS: Very easy to enter expenses; flexible. **CONS:** Needs more report templates; AppleScript expertise required to modify expense reports. **COMPANY:** State Of The Art (714/753-1222). **LIST PRICE:** $139.95; PCMCIA card version $159.95.

MW ★★★

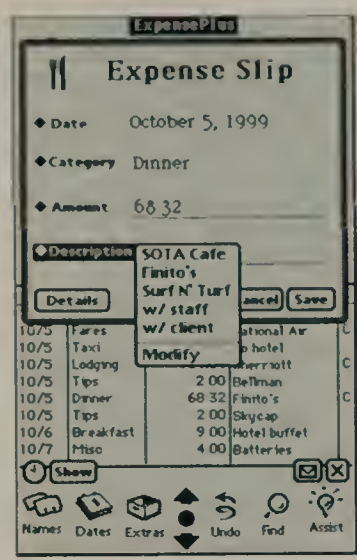
TRACKING EXPENSES IS A PAIN. ExpensePlus uses the Newton MessagePad to record your expenses, then sends the data to your Mac to create and print expense reports. It's useful and a real time-saver.

You install the disk version of ExpensePlus using Apple's Newton Connection Kit. You also get AppleScript; report templates for Microsoft Excel 4.X, Claris FileMaker Pro 2.X, and Shana's Informed Manager 1.4; and ExpensePlus Receiver, which uses AppleScript to distribute the data to a scriptable reporting application.

Entering expenses is a snap. The top half of the screen contains icons for meals, phone, parking, entertainment, rental, lodging, taxi, mileage, fares, tips, supplies, and miscellaneous. Tap an icon to create a dated expense slip for that category, with spaces for the currency amount and a description. When you tap Save, a summary of that slip appears in a scrolling columnar list at the bottom of the screen. You can flag expenses by type—such as Personal and Company credit card—to group them when you print your report. ExpensePlus handles foreign currencies, and you can enter conversion rates for up to eight countries. When you print the expense report, currencies convert to your home currency.

Meals and Entertainment expense slips include a Details button for recording information the IRS requires, such as the location, business purpose, and guests' names. If you are reimbursed for fuel costs instead of mileage, you can change the Mileage slip to a Fuel slip. The Lodging slip thoughtfully includes fields for rate and number of nights. The program then creates as many Lodging slips as the number of nights you entered, properly dated.

Newton intelligence enables you to add entries in the Newton Notepad that trigger entries in ExpensePlus. For example, if you write "hotel $145" in the Notepad, then tap Assist, ExpensePlus launches and creates a Lodging expense slip. The program recognizes the names of many hotels, airlines, and car-rental companies. Unfortunately, you have to experiment to see which Notepad scribblings automatically yield correct expense slips.



Easy Entry Put your frequent haunts in the custom pop-up menu.

Printing expense reports is slightly less straightforward than entering them. After hooking the Newton to your Mac with the Newton Connection Kit's serial cable, you launch ExpensePlus Receiver on the Mac. AppleScript launches your reporting application (usually Excel or FileMaker Pro) with the selected report template, then fills in the template with your data. There are three templates for Excel, two for FileMaker Pro, two for Informed Designer, and one for exporting to a text file. Modifying templates requires a working knowledge of AppleScript.

Using ExpensePlus to track my expenses is so much better than trying to reconstruct a trip from a bunch of crumpled receipts. If you use a Newton, ExpensePlus is a good investment.—TOM NEGRINO

Caduceus Science Review Macintosh Project 1.0

Interactive Science Review

PROS: Exact match to MCAT contents; imaginative use of animation is a real pedagogic breakthrough. **CONS:** Some spelling errors and a few incorrect explanations. **COMPANY:** Scientia (617/776-3427). **LIST PRICE:** Monochrome $150; color $250.

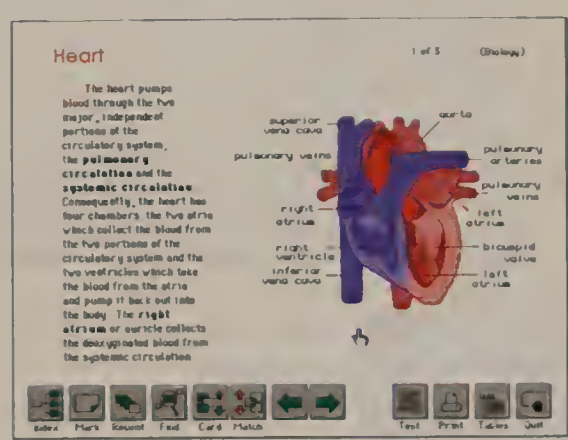
MW ★★★★

SCIENTIA'S NEW PRODUCT, CADUCEUS Science Review Macintosh Project, includes reviews of the four key topics (chemistry, organic chemistry, physics, and biology) on the Medical College Admissions Test (MCAT). The reviews present an extremely selective view of undergraduate science education, focusing only on the subset likely to generate MCAT questions. This selection means that the material has a conservative bias toward, for example, old chemistry problems that have been plaguing students since World War I, but the point of the product is to get you past the MCAT, not to present a refreshing view of modern science.

With this in mind, Caduceus Project offers a nice set of organizational tools for brushing up on specific topics. There's a tree-diagram overview of contents, and a Find function that collects sets of screens according to user-selected topics (you can print out the sets for later review). You can mark individual screens to browse as your own personal review set. This is one of the most efficient ways to use the program; switching back and forth from information screens to the test screen, you can isolate your weak spots and then selectively practice on these topics. The correspondence between Caduceus Project tests and the MCAT is sufficiently precise that you can determine which areas you don't need to review, saving plenty of time. If you're getting all the reaction mechanism problems right, go work on some acoustics problems.

Scientia has done some clever work in animation, figuring out ways to add real information to standard text diagrams by moving parts of the diagram and adding sound (see "Have a Heart"). It's eye-opening to see how much reaction-mechanism drawings and stock pictures from kinematics are improved with relatively simple animation. Besides the easy navigation and reviewing features, animation makes Caduceus Project more valuable than plain-text reviews. After a while, you can see a way to improve any static diagram with a little animation, so perhaps future versions will contain more (about one picture in ten is animated). Besides a need for even more animation, the only other negatives in Project are occasional misspellings and a few incorrect explanations (errors faithfully copied from common textbooks).

It's easy to condense these observations to a single line: if you're taking the MCAT, you would be *nuts* not to buy Caduceus Project. Its 9MB of files are certain to improve your score.—CHARLES SEITER



Have a Heart Besides the usual physiology-text diagrams, Caduceus Project features QuickTime movies of functions. This heart pumps blood on screen, and you can hear it beat.

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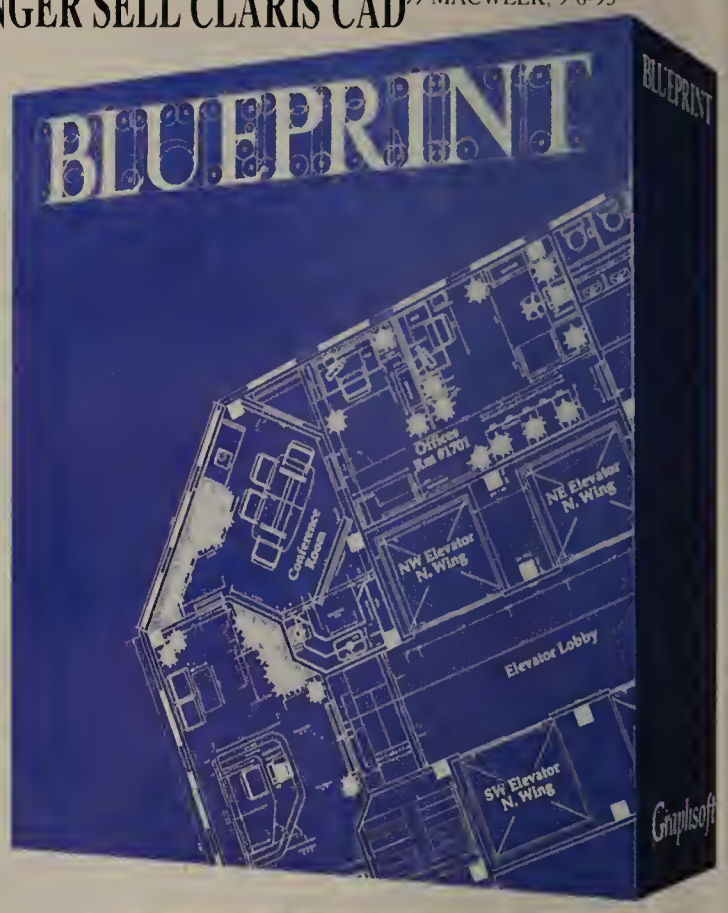

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- ☐ chamfers
- ☐ tolerancing
- ☐ 9 saved views
- ☐ hatching

3D CAD:

none

Integrated Database/Spreadsheet:

none

Programmability:

none

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- ☐ editable line styles
- ☐ pan by scroll bars or hand
- ☐ color by object or layer
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- ☐ editable fills
- ☐ beziers
- ☐ wall-join
- ☐ chamfers
- ☐ tolerancing
- ☐ unlimited saved views
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- ☐ export EPSF
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- ☐ classes
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Circle 46 on reader service card

Print Shop Deluxe

DTP Templates and Graphics

PROS: Easy to install and to use; broad spectrum of templates, graphics, and text effects; prints nicely on color printers. **CONS:** Printed text doesn't always match screen text; no control over leading or kerning; no nudge keys. **COMPANY:** Brøderbund Software (415/382-4400). **LIST PRICE:** $50.

MW ★★★★

SINCE THE DAWN OF DESKTOP PUBlishing, Macintosh users have been creating unique personal correspondence and notices. Some attempts are more, ahem, successful than others. With the release of Brøderbund's Print Shop Deluxe, even the most ham-fingered can produce professional-looking greeting cards, signs, banners, letterhead stationery, and calendars.

Those already familiar with Print Shop will find the enhancements in Print Shop Deluxe to be welcome boons. After opening a project—a fold-over card or a monthly calendar, for instance—you choose from among hundreds of colorful backdrops, borders, and graphics. The harried and the timid might want to pick one of the suggested layouts and simply drop elements onto it. The more daring will appreciate that all text and graphics can be moved, resized, or rotated without fear of jaggies.

The program comes with 30 TrueType fonts. Some, like Palatia, Paramount, and Tribune, are standard typefaces appropriate for body text; others, such as the clown-like Bazooka, scary Stylus, and nostalgic Fillmore, are evocative headline and banner typefaces. You can even create drop caps that rest within decorative boxes, and you can apply special effects such as outlines, shadows, and blends.

Do keep in mind that Print Shop Deluxe is not a substitute for high-end graphics applications. You can scale or flip the supplied graphics, for instance, but you can't change a smile to a frown or a red to a blue. On the other hand, you can use the included Graphics Exporter utility to export the graphic as an EPS or PICT file, open it in a graphics program, alter it, and import it to Print Shop Deluxe as a PICT file.

Type capabilities are also somewhat limited. You can choose a font, size, and color for a text block, and you can even mix attributes within a text box on a character-by-character basis. But you have no control over leading or kerning. The worst problem I encountered became apparent when I printed some of my test projects. Text that appeared on the screen was cut off in the printed version. To print the entire text block, I had to reduce the size of the screen type before printing again. The good news is that the images reproduce beautifully on both color and black-and-white printers.

Print Shop Deluxe is, alas, not for everyone. You must have a Macintosh II or later, System 7, 4MB of RAM, and at least 6MB of free space on a hard drive. The application comes on three 1.44MB disks and includes an excellent manual and tutorial. For those faced with producing professional-looking projects on tight schedules and budgets, Print Shop Deluxe is hard to beat.—SUZANNE STEFANAC

Backgrounds Galore To choose a background for a Print Shop Deluxe project, just click on a scrolling field. If a particular example isn't quite what you're looking for, clicking on a new choice halts screen redraw and brings up the new preview image.

G-Vox

Guitar-Instruction Hardware-Software

PROS: Simple; inexpensive. **CONS:** Software doesn't live up to hardware's promise. **COMPANY:** Lyrrus (215/922-0880). **LIST PRICE:** $399.

MW ★★

ASK A NEW YORKER IN A PLAYFUL mood how to get to Carnegie Hall and you'll get the time-honored response, "Practice, practice, practice." Indeed, practice is the only way to master a musical instrument; no amount of ingenious technology can replace hours spent in pursuit of mastery. Hopefully, though, technology can find a way to make the hours pass more quickly and fruitfully.

G-Vox is a hardware-software combo package that lets your Mac "hear" the notes you play on your guitar. In practice (pun intended), the hardware works pretty well. A flat, rectangular, spidery thing equipped with legs and suction cups fits over your guitar strings just above the bridge (comfortably out of the way of busy hands). Sensors translate string vibrations into electronic signals. A cord runs to an external box equipped with controls to adjust the sensitivity of each string sensor. The box sends the signals to your Macintosh's serial port, and suddenly your computer can hear you play. Installation isn't difficult, but it is time-consuming.

The manual leads you through the hardware setup confidently and comprehensibly, and follows up with an equally thorough approach to the G-Vox utility software. There, you can adjust how loudly you have to play a note before the software registers it and how far the note has to decay before it disappears. Notes appear—albeit slowly on my Mac IIsi—as filled white circles on a graphic fretboard that appears across the top of the screen. G-Vox is decidedly sluggish on anything less than a fast 030 machine, even with the Monitors control panel set to black and white (which the manual suggests for better performance). You can also tune your axe with an electronic tuner built into the program—a very handy feature.

The premise of the included software, Riffs, is that it teaches you to play short, harmonious sequences of notes (known as licks or riffs), which will improve your technique and ear. Selecting a riff brings it up on the screen in both musical and tablature notation. You then play through the riff while your Mac illuminates an on-screen fretboard with white circles for notes you actually played and white squares for notes you should have played. You can ask the Mac to play a riff for you to hear what it sounds like, and you can have your Mac play along with you. It's a neat idea, and fun to fiddle with, but the execution leaves much to be desired.

The software feels hastily thrown together, with some basic interface problems. For instance, each riff includes musical commentary. That commentary, however, is buried in a screen-eating dialog box that doesn't let you see the riff while you read about it. Furthermore, while you're playing, you must divide your attention between the fretboard and the riff. If you watch your performance on the on-screen fretboard, you can't read the music, and if you read the music, you can't watch the fretboard. If you're playing along with the computer (thankfully, you can alter its speed with a metronome slider), you don't really need to watch the fretboard because you can hear when you've made a mistake. But this begs the question, "Why bother with all this messy hardware in the first place?"

So far, G-Vox is cool technology in search of an application. The hardware works reasonably well, but until some satisfying software shows up, $300 will go a long way toward lessons and sheet music, both of which will stand you in better stead than G-Vox.—CAMERON CROTTY

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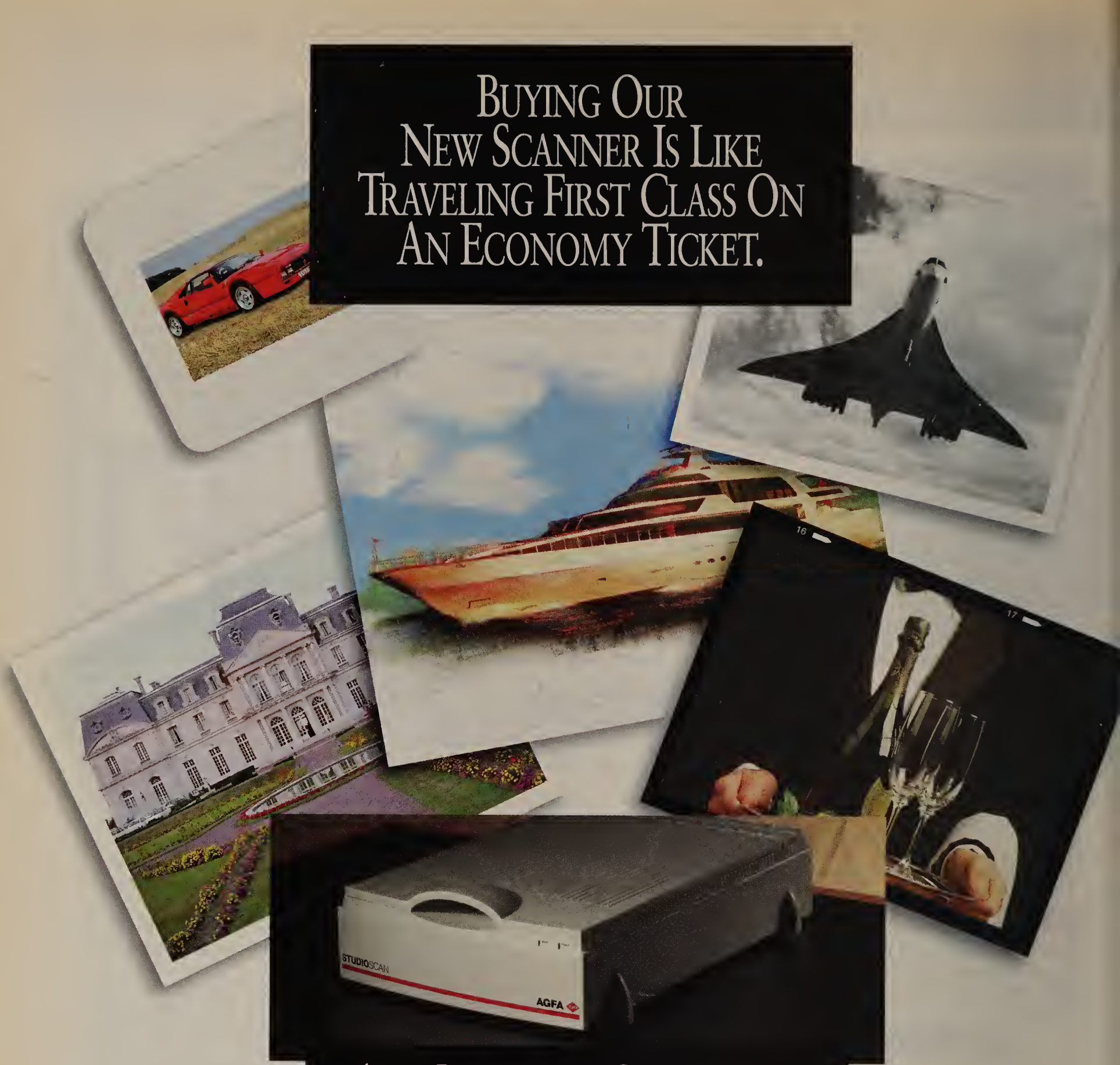

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It used to be that unless you had a lot of money to spend, a scanner was simply out of the picture. But now there's Agfa StudioScan, the new feature-rich scanner that's wonderfully affordable.

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Circle 158 on reader service card

Yamaha YST-M10 Powered Monitor Speakers

Powered Speakers

PROS: Easy to set up; good balanced sound, great volume range; outstanding price. **CONS:** May not have enough bass for some users. **COMPANY:** Yamaha Corporation of America (714/522-9240). **LIST PRICE:** $149.95.

MW ★★★★

THERE'S NOT MUCH DIFFERENCE between studio monitors and the new crop of speakers built to take advantage of the Macintosh's stereo output. Both are self-powered, magnetically shielded from electronic interference, and responsive across a wide range of sound. With the YST-M10 system, Yamaha, long a presence in pro recording, enters the computer-speaker market.

Setting up these speakers is simple. Drawings on the back of each speaker show how to connect the supplied cables between the two speakers and the computer or other sound source. There are no bare wires to fuss with. The connectors plug directly into the Mac. The AC power supply is included, as are both RCA and 6.25mm phone-jack adapters.

The cabinets are lightweight—2 and 2.2 pounds for the left and right, respectively—and about 8.5 inches high and 6 inches deep. The front grille curves gently outward, away from your monitor, to accommodate the bass chamber. With their sweeping curves and ivory color, these speakers look sharp next to any Mac. They also come in black for the more daring.

The front of the right speaker—which contains a 10-watt amplifier—has a power switch, a presence control for boosting response to vocal and speech frequencies, and a volume control. The knobs are logically placed and a cinch to use.

SCOTT PETERSON

The Yamaha YST-M10 speakers

The speaker cones are made from spruce shavings culled from Yamaha's piano factories. Long-fiber spruce is well suited to the purpose, plus it's good recycling.

Small speakers aren't noted for bass response, but these have a very acceptable low range. Yamaha's Active Servo Technology, used in the company's higher-priced equipment, electronically boosts bass, making the speakers sound larger than they are without sacrificing the high end or the midrange. (Expect a subwoofer system soon for the bass-hungry.) Overall, the speakers have a sweet, transparent sound, handling audio from the Mac's stereo output well enough for most presentations, 16-bit sound on games, and music.

The adapters provided by Yamaha tempted me to plug the speakers into other audio settings. I tried out the speakers as satellite speakers with my home stereo, plugged them into a portable CD player, and even used them as monitors with my band's PA system, all with stellar results.

The list price of the speakers is very competitive, and audio equipment often sells at a discount. The YST-M10s are an excellent balance of value and performance and speak well for Yamaha's first efforts in computer speakers.—RICHARD FENNO

Intellicolor Display/20

20-Inch Color Monitor

PROS: Excellent monitor. **CONS:** Intellicolor software cannot save different settings; button to prevent others from changing settings resets when monitor is turned off. **COMPANY:** Radius (408/434-1010). **LIST PRICE:** $3199.

MW ★★★

SOME PRODUCTS SOLVE PROBLEMS that don't exist. The Intellicolor Display/20, a 20-inch Trinitron monitor bundled with software that lets you control the settings of your display, but without a video board, is one of those products. Of course, everyone needs a monitor, and this monitor is excellent. However, the Intellicolor software is the flotsam of an otherwise worthwhile product.

The Intellicolor system solves the problem of obscurely labeled or inconveniently placed controls. (The controls of the Intellicolor are on the front.) The Intellicolor application lets you adjust the monitor's settings through software. Changes are sent through the video cable to controlling circuitry in the monitor (or through a serial cable if you're using another video board). While button confusion and inconvenience may frustrate some, most of us set the brightness, contrast, and display size of our monitor once—when we first bring it home—and then never touch the settings again.

Although simple and functional, the Intellicolor software is extraneous. People who know enough about monitors for precise tuning typically figure out the controls (despite some mystifying icons), adjust the display, and then never change the controls again. Others have someone else set up their monitor, or call tech support for guidance in diagnosing problems.

Intellicolor puts 13 adjustments—from contrast to electron-gun convergence—under animated icons on your screen. The animations let you know visually what the button does. An online help system—conveniently available in six different languages—explains in simple terms how each button functions and why it is important.

Buttons and pop-up menus provide the rest of the software's limited functionality. You have your choice of three predefined white points—independent-electron-gun and gamma control are absent, although the monitor itself supports them. The Undo button undoes only the last setting you changed. The Restore button resets the display to factory defaults. Finally, the Disable button prevents passersby from fiddling with the controls on your monitor's front panel by disabling their functions. This might be handy except that when you toggle the monitor off and on (say, when you go home at night, then return the next day), the front-panel controls are again fully active, and any Joe can haphazardly fool with your trapezoidal balance while you're getting coffee.

The Intellicolor software would be much more useful if it allowed you to save different settings for cases when switching resolutions shifts the display area too far to the left, or when you want the display area to extend to the edges of the screen with a particular white point. Many monitors have special front-panel buttons to save settings for these kinds of circumstances. However, the Intellicolor software—potentially the most flexible system of all—does not.

Although with its exceptional brightness and clarity the monitor would be a fine addition to any designer's desk, the Intellicolor software is not even as useful as Radius's standard monitor software, which provides on-the-fly resolution switching, a screen saver, and several other convenient features. The selling point of this system is the added value of the Intellicolor software, and that added value just isn't there.
—TIM WARNER

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Object Master for Think C and C++

Object-Oriented Development System

PROS: Automatically coordinates Object Master and Think projects, color-codes files and keywords, supports SourceServer AppleScript. **CONS:** Could use more AppleScript documentation and examples. **COMPANY:** ACI US (408/252-4444) **LIST PRICE:** $255.

MW ★★★★

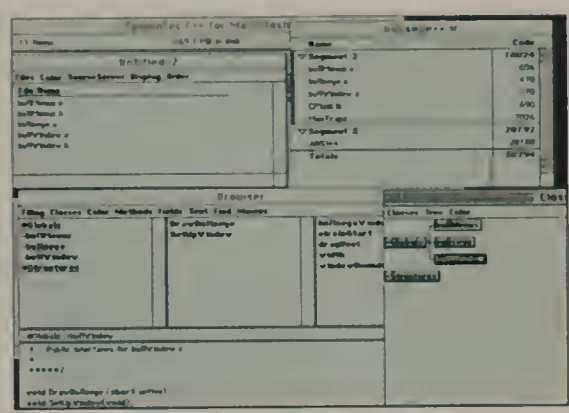
ACI US'S OBJECT MASTER FOR Think C and C++ is an adaptation of its Object Master Universal Edition (Object Master version 2.1). Essentially, all comments apply both to Object Master for Think and to Object Master Universal.

The new version of Object Master is full of goodies. Color-coding of files, classes, and programming keywords, for example, seems like a small point, but it makes navigation through source code much easier. If you have Apple's SourceServer (likely, since it's included with Think C 6.0), you can use a SourceServer pop-up menu to track the checked-in/checked-out status of files. As an additional help to multiprogrammer projects running across a network, OM now reports physical file location (actually, complete path name and modification date) for each file in a project. The OM Class Tree window lets you cut and paste sections of the class tree and display them in separate windows.

The OM Browser window itself is a nearly ideal environment for editing source code (you can also edit in the File window). Because OM automatically keeps track of classes, functions, data types, and other file elements, it can generate templates in which you simply find and paste function arguments. With a little planning, you can generate pages and pages of code simply by selecting classes, methods, and arguments from lists. All this work finds its way back to the Think project environment automatically via Apple events, so without leaving OM you can construct a correctly organized Think C or C++ program.

One minor complaint about OM is that the package gives you only 11 AppleScript examples and only a formal definition of AppleScript in an appendix, rather than some discussion of AppleScript use in its own chapter. Perhaps ACI US figures that experienced C++ programmers are likely to be old AppleScript hands as well. The relative scarcity of scriptable applications until this year has made learning AppleScript less than a burning concern, and more examples and a few pages of tutorial on customizing OM with AppleScript would enhance the program.

The economic basis of Object Master acquisition is pretty straightforward. Figure programmer time to cost somewhere between $25 and $70 per hour, depending on the programmer and the job. Next you can calculate about a 20 percent improvement in programmer productivity with OM—this is a worst-case estimate based simply on time savings from Object Master's advanced editing features. That means that Object Master pays for itself in a week, even at suggested retail price.—CHARLES SEITER



Looking Up The editor in Object Master's Browser window supports a Find And Paste Method Call command that looks up parameters for you in OM's data dictionary. This not only saves time but helps avoid trivial errors.

FotoTune 1.1

Color-Management Software

PROS: Capable color-management engine; can create scanner profiles; supports wide variety of devices. **CONS:** Cannot create or modify output profiles; some profiles don't work; poor documentation; invisible tech support. **COMPANY:** Agfa Division of Miles (508/658-5600). **LIST PRICE:** $795.

MW ★★

AS DESKTOP PUBLISHING TECHNOLOGY has matured, several color-management systems have emerged to improve the correspondence between original images, on-screen display, and output to color printers and color separations. Agfa's FotoTune, a somewhat amorphous collection of programs, is one contender.

To use FotoTune, you scan one of the three included color references (reflective, 35mm transparency, and 4-by-5-inch transparency). Then, based on that scan, you build a ColorTag that describes how your scanner "sees" colors. This process is really optimized for use with Agfa scanners. You can build ColorTags for scanners that have Adobe Photoshop Acquire modules (and there's an undocumented TIFF-importer module provided for those that don't), but FotoTune's documentation doesn't even tell you what resolution to use.

Next you build ColorLinks—color-transformation tables—based on the ColorTag you've created for your scanner and the output ColorTags that Agfa provides. FotoTune uses these ColorLinks to correct scanned images for various output devices. For example, you might build a ColorLink to convert from an Agfa Focus scanner to an Apple 13-inch display, or from a SuperMatch display to a particular offset printing method. Building ColorLinks is slow work—if you're building more than a few you'll want to run the program overnight—but you only have to build them once.

You can use ColorLinks via Agfa's FotoLook and FotoScreen applications, via included Photoshop plug-ins, or via a QuarkXTension that handles the RGB-to-CMYK image-separation work when you print from QuarkXPress. In Photoshop you can use a filter to transform an image for screen display, or use an export module to send CMYK separations targeted to a particular device. You can also save ColorTags as Apple ColorSync profiles

Processing an image created on a Hewlett-Packard ScanJet Hcx through the FotoFlow CMYK export module for Photoshop resulted in very good color correspondence between the original and final output, as did conversion from a ScanJet scan to the CIE LAB device-independent color model. In most respects, however, my experience with FotoTune was a litany of problems. Here's a short list.

Each of the program's 13 disks has its own installer, so installation is a pain. There's no way to create new, or to modify existing, ColorTags. The ColorTags for the Apple 13-inch display and Canon CLC 300 with Fiery RIP (two I was able to test) just don't work; the colors are totally off.

Multiple, overlapping, and unindexed manuals provide excruciating detail on the mathematics of color-space conversion, but they don't even describe the provided ColorTags, most of which are cryptically named. The only documentation for the FotoFlow XTension is 270 words in a Read Me file. There's no tech-support number listed anywhere, so I called Agfa's main number, which I found in some marketing literature. Agfa shuttled me to three different 800 numbers; I left two messages at the final number (where someone asked, "Is this an Agfa product?"), and no one ever called back.

A capable color-management engine lurks amidst all this litter, but as for the complete color-management solution that Agfa touts—it just ain't there yet.
—STEVE ROTH

Window
CMYK
Fore

Mitsubishi Flat Square Monitors Give Your World A New Perspective.

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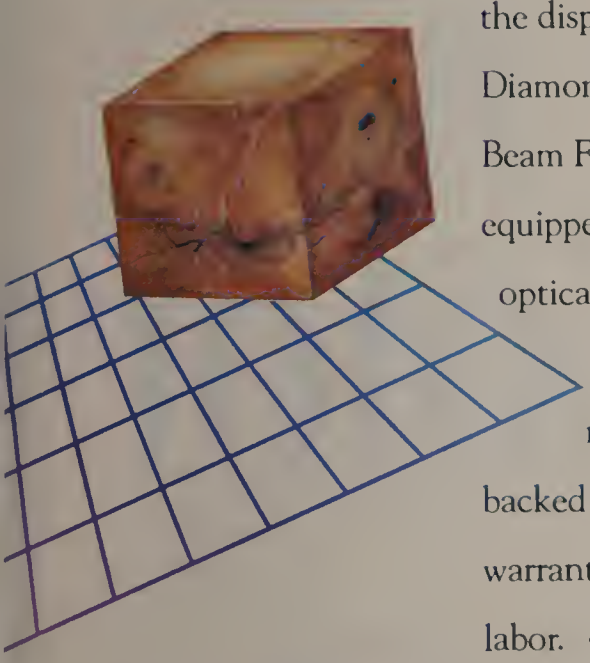
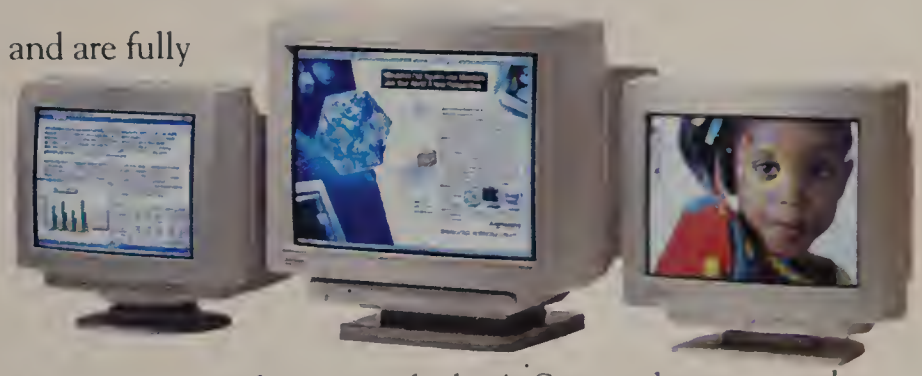
Explore a brilliant new world of increased display clarity with Mitsubishi's third generation of flat square color monitors, including the Diamond Scan 15FS, Diamond Scan 17FS and Diamond Pro® 21FS. The Mitsubishi 15", 17" and 21" flat square line reduces image distortion and screen glare while delivering high-end performance, quality and features – all at exceptionally competitive pricing. ♦ Each of the models features an ultra-fine 0.28 mm dot pitch suitable for all high resolution applications; an Invar mask for sustained high brightness levels; an ergonomically-designed, compact enclosure with a tilt-swivel base; and the easy-to-operate, microprocessor-based front panel user controls allow you to fine tune the display to your color board. To provide the highest levels of display accuracy, the Diamond Scan 17FS and top-of-the-line Diamond Pro 21FS incorporate Dynamic Beam Forming, which reduces image distortion found at the edges of any monitor not equipped with this feature. ♦ Both units also feature Mitsubishi's exclusive new optical quality anti-static and anti-reflective coating on a high contrast tinted CRT.



What's more, all three monitors meet strict international guidelines for low magnetic emissions and are fully backed with a three-year warranty on parts and labor. ♦ No matter which Mac® you're using, simply select the appropriate cable adapter from your dealer.* See our latest — *and greatest* – generation of flat square monitors for yourself. And gain a new perspective on quality, durability and value. ♦ For more information, call us at 1-800-843-2515. In Canada, call 1-800-387-9630 or in Mexico 91-800-83456. *For immediate information call Mitsubishi Qwikfax at (800) 937-2094.*



DS15FS: $645 MSRP
DS17FS: $1,299 MSRP
DP21FS: $2,999 MSRP

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DISPLAY PRODUCTS

Mitsubishi Electronics America, Inc., Display Products, 5665 Plaza Drive, Cypress, CA 90630
Mitsubishi Electric Sales Canada, Inc., 4299 14th Avenue, Markham, Ontario L3R 0J2

Free signal cable adapters available for the Macintosh LC, Centris, II, and Quadra families.
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Circle 261 on reader service card

Fast Track to 24-Bit Color

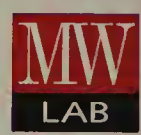
Macworld Lab tests video-acceleration cards designed for graphics professionals

BY DEKE McCLELLAND

Before computers, artists had it easy. After all, when they painted on a canvas, the canvas reciprocated by displaying the image in true, undiluted color. There was no RGB-to-CMYK color loss, no heated arguments with the local service bureau over color mismatch, no praying to the Commission Internationale de l'Eclairage (CIE) over color models. Oh sure, paints and canvas were relatively expensive, and guys like van Gogh and Gauguin didn't have two nickels to rub together, but at least they didn't have to fork over their life savings and take out a loan just to see what they were doing on a screen hardly bigger than a seventeenth-century Dutch miniature. Of course, they didn't have the artistic tools available that Macs provide, either.

But while the price of being a computer artist is high, there are areas in which you can save money. In testing eight 24-bit NuBus video-display cards designed for professional graphic artists and publishers, Macworld Lab found the usual crowd of products that accelerate the display of full-color graphics on large-screen monitors for the price of a ticket to the moon: upwards of $5000. But we also discovered a few bargains that performed almost as well for a lot less money.

Surprisingly, our testing revealed that most artists and designers will derive as much benefit from inexpensive accelerated video cards as from expensive ones. This is because, while QuickDraw accelerators speed up common screen-display tasks, such as window drawing and scrolling, they do little to expedite the kinds of custom graphics routines commonly used in illustration and page-layout programs.



Although one video card may draw window elements faster than another—shaving off as much as, say, a full second—neither card will quicken the redraw of complex graphic elements inside your document, which is by far the more time-consuming task an artist or designer faces. In fact, in blind tests and without the aid of stopwatches, we were rarely able to distinguish the performance of one accelerated video card from another.

So if money is no object, feel free to go for broke and buy the best card that technology has to offer, particularly if it also offers other features that you need, like accelerated CMYK work in Photoshop. But if money is scarce, you can save a few thousand bucks if you're will-

ing to endure the occasional infinitesimal slowdown. (But don't go to the extreme and get an unaccelerated video card: they are noticeably slower than accelerated cards, and their slight cost savings is not worthwhile for a professional graphics user.)

Photo-Realistic Color Is a Must

For artists, multimedia professionals, and those who simply want to amaze themselves with the most realistic computer imagery possible, 24-bit display (16.7 million colors) is practically essential. Graphics enthusiasts agree that 8-bit display (256 colors) is intolerable for anything beyond basic desktop publishing, and although 16-bit display (32,768 colors) may be sufficient for color DTP and 2-D illustration work, the amount of dithering required to represent full-color screen images limits your ability to edit and composite high-quality scans, 3-D renderings, and digital movies. For that kind of detailed work, 24-bit color is clearly a must.

But while anything less than 16.7 million colors is a crying shame, only four machines in the history of the Mac have been able to display 24-bit images from their on-board video ports: the discontinued Quadra 700 and 900 and the top-of-the-line Quadra 950 and 840AV. Provided you have upgraded the motherboards to their maximum 2MB of VRAM, you can view 16.7 million colors on both 14-inch and 16-inch monitors.

If you are among the majority of folks who do not own one of these machines, or if you are thinking of purchasing a larger monitor, you should include a 24-bit video card on your shopping list. Available from a variety of sources, including Apple, these cards divide into two camps: hugely expensive, state-of-the-art supercards—typically from SuperMac Technology and RasterOps Corporation—and a larger contingency of moderately priced products from such companies as Radius, Lapis Technologies, and SuperMac's E-Machines division.

Why Speed Differences Are Small

Many video cards provide separate chips designed to accelerate a handful of QuickDraw routines commonly called by the system software and other applications. This QuickDraw acceleration is not only the most publicized criterion in evaluating 24-bit video cards, it is also arguably one of the least compelling. This is one area where advertised data and real-world experience rarely match. It isn't that vendors lie, but they typically derive their performance data from automated testing utilities. After showing that these automated tests bear little resemblance to real-world performance (see "24-Bit Color Graphics," *Macworld*, February 1993), we at Macworld Lab decided to abandon them in favor of task-oriented tests run and recorded by actual human beings (see the sidebar "Behind Our Tests").

The result is bad news for artists. While a vendor may make extravagant claims for the performance of its products—heralding speed increases from 500 to 2000 percent—we were hard-pressed to find many subjective benefits to using accelerated video cards, particularly inside such graphics-intensive applications as Aldus PageMaker, QuarkXPress, Adobe Illustrator, Aldus FreeHand, and Adobe Photoshop. Instead, nongraphical tasks, such as line scrolling, saw the greatest benefit.

For example, in tests where we pressed and held down the scroll arrow inside Microsoft Word and Excel, and other popular applications, the scroll speed improved by as much as 1000 percent when using QuickDraw acceleration (see the benchmarks "How 24-Bit Video Cards Stack Up"). But this kind of scrolling is more commonly used inside word processors and spreadsheets than inside graphics programs. If you move within a page using a grabber-hand tool—as is the preferred method in Photoshop, Illustrator, QuarkXPress, and PageMaker—the speed benefit is so nominal as to go virtually unnoticed. Other common functions—including entering

How 24-Bit Video Cards Stack Up

APPLICATION-SPECIFIC TESTS

Best result in each test where there is at least a 10 percent speedup over the next-fastest card. Grayed text and performance bars indicate built-in Mac video used for comparison. Products are listed in decreasing order of overall performance.

Times are in seconds. Smaller bars are better.
Use these results to compare video cards' performance against each other for the applications you use most. In only four tests—FreeHand Magnify, PageMaker Scroll, PageMaker Magnify, and QuarkXPress Scroll—did we find significant differences (20 percent or more speedup) between the slowest and fastest video card. (Note that these results do not represent performance differences among applications. All video cards were tested on 16-inch monitors at 832-by-624-pixel resolution.)

	Adobe Illustrator 5.0		Aldus FreeHand 3.1		Aldus PageMaker 4.2		QuarkXPress 3.2	
	Preview	Magnify	Preview	Magnify	Scroll	Magnify	Scroll	Magnify
SuperMac Thunder II GX•1360 *	12.1	11.4	11.5	11.1	4.2	1.0	14.4	3.7
SuperMac Thunder/24	12.2	11.6	11.5	11.3	4.2	0.9	14.9	3.7
SuperMac E-Machines Ultura LX	12.3	11.5	11.5	11.3	4.5	0.9	15.4	3.8
SuperMac Spectrum/24 PDQ Plus	12.1	11.6	11.6	11.3	4.7	1.0	16.2	3.7
Radius PrecisionColorPro 24X	12.1	11.4	11.7	12.4	5.0	1.5	17.0	3.7
Radius PrecisionColorPro 24XP	12.1	11.4	12.0	12.5	5.3	1.5	17.5	3.8
Centris 650 built-in video **	11.8	11.1	10.6	9.8	6.0	1.2	19.8	2.8
RasterOps PaintBoard Turbo	12.7	11.3	12.3	10.1	5.8	1.6	17.4	4.3
Quadra 700 built-in video ***	13.6	12.8	12.3	12.1	9.5	1.7	30.3	3.8

** Performance for Thunder II•1360, which lacks a CMYK-to-RGB conversion chip, is identical in these tests.*
*** With 1MB of VRAM installed for 16-bit color; used as the baseline against which other video options are compared.*
**** With 2MB of VRAM installed for 24-bit color.*

Ever since Apple introduced the IIci over four years ago, every desktop Mac except the IIfx, Classic, and Classic II has offered a built-in video port, letting you hook up a monitor without first purchasing a separate video card. But the capabilities of built-in video vary considerably from Mac to Mac, based on the amount of video RAM (VRAM) available to your system. (Only two Macs with built-in video—the discontinued IIci and IIsi—do not support VRAM, instead stealing resources from the same RAM chips used by the rest of the system.) More VRAM means better color on larger monitors.

Each Mac comes with at least 256K of VRAM; you can add SIMMs to upgrade the VRAM to as much as 2MB, depending on the sophistication of the Mac's motherboard. For example, the original LC shipped with 256K of VRAM and could be upgraded to 512K. The top-of-the-line Quadra 840AV ships with 1MB of VRAM and can be upgraded to 2MB. Among the most recent crop of Macs, most 030-based LCs and Performas top out at 768K of VRAM; most 040-based machines top out at 1MB.

VRAM delivers color in inverse proportion to the resolution of your monitor (see the table "How Many Colors Does Built-in Video Provide?"): the higher the resolution, the lower the number of colors. Generally speaking, you need to have enough VRAM to hold the entire screen image at once. To accommodate 256 colors on a 640-by-480-pixel screen, this means that you must have at least 307K of VRAM (1 byte × 640 pixels × 480 pixels = 307K; note that each 8 bits of color takes 1 byte in this calculation). As you increase the screen resolution, you must likewise increase the amount of VRAM or suffer having fewer colors.

Calculating the VRAM requirements for 24-bit display gets a little trickier. No Mac lets you display 16.7 million colors at resolutions higher than 832 by 624 pixels (the standard for 16-inch displays). But you might think that 1MB of VRAM would accommodate 24-bit color on a 13-inch monitor, since 921K (3 bytes × 640 × 480 = 921K) is significantly less than 1MB. After all, NuBus cards with 1MB of VRAM can display 24-bit color on 14-inch monitors, so why not internal video?

The reason is that NuBus cards and on-card video work differently to best exploit the inherent discrepancies between the fixed NuBus access speed of 10MB per second and built-in video's system-dependent direct-memory access speed, which is typically 10 or more times as fast.

Still with me? Well, before your eyes glaze over, consider this: Most NuBus cards rely on what's called the chunky planar storage mode to use just 1MB to achieve 24-bit color depth. This mode fully uses its 1MB of VRAM by loading a 24-bit screen image in three separate passes, one for each RGB channel. The system is inefficient, but the speed loss goes largely unnoticed, thanks to NuBus's inherently slow access speed.

But built-in video can't hide behind a slow NuBus access speed, so it has to sacrifice some color depth. To load the screen image in a single pass, the system is forced to read and write pixels in 32-bit units. The result is that a 14-inch monitor's image consumes 1228K (4 bytes × 640 × 480)—that's more than 1MB of VRAM can accommodate.

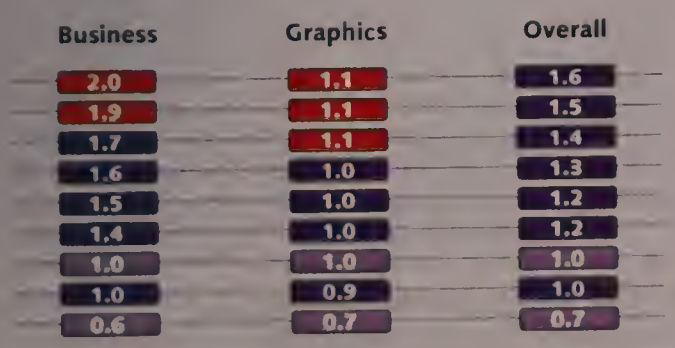
As a result, most Quadra users will need to purchase a separate video card to access 24-bit color. Either that or settle for a 512-by-384-pixel 12-inch monitor.

How Many Colors Does Built-in Video Provide?

VRAM	12-Inch (512 × 384)	13-, 14-Inch (640 × 480)	15-Inch (portrait) (640 × 870)	16-, 17-Inch (832 × 624)	19-, 20-Inch (1024 × 768)	21-Inch (1152 × 870)
256K	256	16	4	16	4	4
512K	32,768	256	16	256	16	16
768K	32,768	32,768	256	256	16	16
1MB	16,777,216	32,768	256	32,768	256	256
2MB	16,777,216	16,777,216	32,768	16,777,216	32,768	32,768

VIDEO-PERFORMANCE INDEX

Times as fast as a Centris 650's built-in video.
Use these ratings of overall performance to compare video cards' performance when used with a variety of applications, as detailed in the sidebar "Behind Our Tests."



text in PageMaker, drawing in Illustrator's preview mode, and painting in Photoshop—similarly escaped significant acceleration since they rely on custom drawing routines, bypassing QuickDraw and thus any QuickDraw speedup.

Here's the impact acceleration had on the most popular graphics applications:

- In Photoshop, zooming was not perceptibly faster. Maneuvering around an image with the hand tool was smoother, but it took no less time to get from one point to another. Scroll speed improved only when we used the scroll arrows.
- In FreeHand, the only meaningful acceleration occurred when magnifying the drawing area in the preview mode.
- In Illustrator, acceleration made next to no difference.
- In PageMaker, scroll speed improved, but not quite to the same extent as in Word or Excel. The magnification speed also improved.
- In QuarkXPress, scroll speed improved by an amount similar to PageMaker's level of improvement, but magnification speed did not improve noticeably.

For graphics professionals, the primary benefits of QuickDraw acceleration are smoother screen redraw and better performance on high-resolution 19- and 21-inch monitors. While the smoother redraw is essentially an aesthetic concern, it can affect how you perceive an image and how quickly you recognize areas that need attention. Although Macworld Lab tested the boards on systems using 16-inch monitors, the speed improvements are proportional to those for smaller or larger monitors—if a card is 20 percent faster on a 16-inch monitor, it will be 20 percent faster on a 21-inch monitor.

But you're more likely to notice the performance improvement on a large monitor because the increased screen real estate means there's more to redraw. For example, if a QuickDraw function takes twice as long to complete on a monitor that's twice as large, the accelerator will likewise shave off twice as much time, making for a more noticeable—although entirely proportional—improvement. So if a 100-second operation on a 16-inch monitor takes 200 seconds on a 19-inch monitor, a video card that cuts the time in half will make that operation take 50 seconds on the 16-inch monitor and 100 seconds on the 19-inch monitor. To a user, the 100 seconds feels like a greater savings than the 50 seconds.

The Cost of Acceleration

However you judge its benefits, QuickDraw acceleration is pervasive and generally inexpensive. Every NuBus video card that supports 24-bit display on 19-inch and 21-inch monitors provides some kind of acceleration. And while you can purchase unaccelerated cards for 16-inch screens, the savings are marginal. For example, the accelerated PrecisionColor-Pro 24XP from Radius performed nearly twice as fast as the comparable but unaccelerated ProColor-Server 24x II from Lapis ($499, 510/748-1600), and yet the Radius card costs only $100 more.

But while entry-level acceleration is a good value, enhanced acceleration is harder to justify, especially within a single product line. Consider, for example, the Spectrum/24 PDQ Plus and the Thunder/24, both from SuperMac. Although priced at $1499 and $2599, respectively, the only differences between the two cards are the Thunder/24's GWorld memory-expansion slots and improved QuickDraw acceleration. Largely ignored these days, GWorld acceleration requires that you fork over more cash for SIMM chips, and even then it only works with GWorld-compatible programs, the number of which you can count on your fingertips (when was the last time you used Time Arts' Oasis?). That leaves the improved QuickDraw acceleration, which according to our task-oriented tests makes the Thunder/24 only 8 percent faster on average than the Spectrum/24 PDQ Plus—hardly worth the $1100 increase in price. As we went to press, SuperMac began selling the Thunder/24 with a DSP daughterboard installed, so that $1100 difference is now more like a $600 difference. (The Thunder II Light, which has been discontinued, was simply a Thunder/24 with a DSP daughterboard.) If you do not need a DSP card, though, the Spectrum/24 PDQ Plus is a better buy.

Another kind of acceleration that is finding increasing acceptance on 24-bit video cards is digital-signal processing (DSP). Currently dedicated to speeding up key Photoshop image-filter functions, DSP chips are found on the two cards in SuperMac's Thunder II series, including the $4499 GX•1360, which accelerates drawing and editing in Photoshop's CMYK color mode—a real boon to professional color publishers.

As we went to press, RasterOps began shipping a 24-bit card with optional DSP daughterboards.

Accelerated 24-Bit Video Options

Company	Product	Tested By Macworld Lab	List Price	7-Inch Card [A]	DSP Acceleration	Ethernet	On-the-Fly Resolution Switching
Radius	PrecisionColorPro 24X	●	$2499	●	○	○	●
	PrecisionColorPro 24XP	●	$599	●	○	○	●
RasterOps Corporation	24Mx	○	$729	○	○	○	○
	Horizon 24	○	$4999	○	●	○	○
	PaintBoard Lightning	○	$999	○	○	○	○
	PaintBoard Turbo	●	$1389	●	○	○	○
	PaintBoard Turbo XL	○	$1749	●	○	○	○
SuperMac Technology	Spectrum/24 PDQ Plus	●	$1499	○	○	○	● [B]
	Spectrum/24 Series IV	○	$949	○	○	○	● [B]
	Thunder/24	●	$2599	○	● [C]	○	● [B]
	Thunder II•1360	●	$3999	○	●	○	● [B]
	Thunder II GX•1360	●	$4499	○	● [D]	○	● [B]
SuperMac, E-Machines Division	Futura II LX	○	$899	●	optional [E]	●	● [B]
	Futura II SX	○	$499	●	optional [E]	●	● [B]
	Ultura LX	●	$1299	● [F]	optional [E]	○	● [B]

● = yes; ○ = no. *Technical-support ratings are based on a series of calls made to each company by Macworld staffers (posing as customers) to gauge the accessibility, helpfulness, and accuracy ing bonuses and demerits, to derive the final rating. Ratings are for companies, not individual products, and we call only those companies whose products Macworld Lab tests.* [A] *For Centris Macs.* [B] *The software requires you to cycle through zoom levels and pan across a virtual desktop.* [C] *Versions sold before January 1994 do not include DSP acceleration; for these cards, it* [E] *Versions sold before early January 1994 do not support optional DSP acceleration.* [F] *Versions sold before early January 1994 are 12-inch.*

(Mirror Technologies [612/633-4450] planned to have a similar card, called the Tornado, available by the time you read this, but the company recently sold its assets to a different company, and the fate of Mirror's product was unclear at press time.) In our tests, a beta version of the $4999 RasterOps Horizon 24 card performed a little more quickly than Radius's $2499 PrecisionColorPro 24X card. (For a comparison of DSP boards, see the feature "Photoshop Accelerators," in this issue.)

Not all shipping 24-bit video cards were tested by Macworld Lab. Some vendors chose not to submit evaluation copies of products that they suspected would not perform well compared with others. These cards include the unaccelerated ProColorServer series from Lapis, the Futura II series from SuperMac's E-Machines division, and SuperMac's Spectrum/24 Series IV. Other cards not in our benchmarks but listed in the table "Accelerated 24-Bit Video Options" were shipping but unavailable for review; their performance should fall in the same range as the cards tested.

Three vendors have announced cards that may ship by February 1994: Apple (408/996-1010) will ship a new 24-bit card to replace its ancient 8•24 GC. Built for Apple by Radius, the new Macintosh Display 24AC will be a 7-inch NuBus card that supports up to 1152-by-870-pixel resolution at 24 bits; its estimated street price is $1579. Radius plans to replace its PrecisionColor 24XK with the PrecisionColorPro 24XK, a 7-inch board that supports 24-bit color at 1024-by-768-pixel resolution; it has a list price of $999. SuperMac, too, has a new card in the works: the Spectrum Power•1152. The 7-inch card costs $1399 and includes an expansion slot for an optional $599 DSP daughterboard for Photoshop acceleration.

You can purchase a 24-bit PDS card from Lapis Technologies (510/748-1600) if you own one of the following Macintoshes: the Quadra 605; the LC III and 520; and the Performa 450, 460 series, 470 series, and 550 (none of which support NuBus). Lapis is the only company to offer a 24-bit card for these Macs' LC III–style PDS. Like its similarly named NuBus counterpart for other Macs, the $499 ProColorServer 24x—there's no II in the PDS version's

Maximum Resolution at 24-Bit Color	Phone	Toll-Free Phone	Technical-Support Rating
1152 × 870	408/434-1010	800/227-2795	satisfactory
832 × 624			
832 × 624	408/562-4200	800/729-2656	satisfactory
1152 × 870			
1024 × 768			
1024 × 768			
1152 × 870			
1152 × 870	408/541-6100	800/334-3005	good
1024 × 768			
1152 × 870			
1360 × 1024			
1360 × 1024			
1152 × 870	408/541-6100	800/334-7274	good
832 × 624			
1152 × 870			

of the company's support technicians. Macworld uses a point system, includ- 610 and 660AV, Quadra 610 and 660AV, and some forthcoming PowerPC is an optional upgrade. [D] Also includes Photoshop CMYK acceleration.

BEHIND OUR TESTS

MW LAB

Video speeds depend heavily on the Mac model and the application you use. Most operations within applications are dominated by overhead from CPU calculations, system management, and storage delays (for both RAM memory and drive data transfers). Scrolling is one of the few operations that rely heavily on video performance, which is why Macworld Lab tests show that acceleration for real-world graphics and publishing work is nothing near what companies' ads lead you to believe.

Our tests are designed to gauge video cards in the environment of a professional graphic or layout artist, and we tested only accelerated video cards that provided 24-bit color on 16-inch or larger monitors. (We used Sony's 17-inch CPD 1730 and 19-inch GDM 2038 as our test monitors.) First, we scrolled a 13-page Microsoft Word 5.0 document both up and down; then we line-scrolled a 200-row, 104-column Excel 4.0 document up, down, right, and left. This let us gauge the effects of video acceleration on the most common business tasks. We also did grabber-hand scroll tests with a 24-page Aldus PageMaker 4.2 file and a 34-page QuarkXPress 3.2 file, since artists commonly use the grabber-hand tool to move within their pages.

However, artists also do other video-intensive work. So for publishing users, we timed 400 percent magnifications to test a common full-screen redraw operation. Similarly for graphic artists, we previewed and magnified complex drawings with gradient fills in Adobe Illustrator 5.0 and Aldus FreeHand 3.1. Neither of these draw programs showed much improvement with video acceleration; the reason is that both programs rerender the elements in the window during these operations, placing the processing burden on the CPU and hiding any contribution from the video card.

We performed spot checks with Adobe Photoshop 2.5 to see if this popular artists' tool benefited from video acceleration. Although we did see improvement, the tangible result was only smoother scrolls, moves, and redraws. It still took as much time to move from one part of an image to another.—**Macworld Lab testing supervised by Tim Warner**

name—is unaccelerated and supports 24-bit color on 14-inch and 16-inch monitors.

Resolution and Card Size

Another attribute that drives the prices of 24-bit graphics cards is screen resolution. If you own a 14- or 16-inch monitor and don't expect to be in the market for a larger screen any time soon, you can buy into 24-bit color for under $600. The PrecisionColorPro 24XP from Radius and the Futura II SX from SuperMac's E-Machines division are both ideal candidates. If your new 19-inch or 21-inch monitor just about emptied the petty-cash reserves, the Futura II LX—also from SuperMac E-Machines—delivers 16.7 million colors for only $899.

Only three video cards have ventured beyond the 1152-by-870-pixel barrier, and all of them cost more than $3900. The RasterOps Horizon 24 offers several exaggerated resolutions—from 1600 by 1200 pixels to 4000 by 3000—all of which result in a virtual desktop, meaning that you have to scroll to see the entire screen. But to get such high resolutions, you have to sacrifice color: the 1600-by-1200-pixel resolution tops out at 16-bit color; higher resolutions taper off to 2-bit (4 colors). Perhaps a better solution, the Thunder II•1360 and Thunder II GX•1360 offer resolutions as high as 1360 by 1024 pixels (commonly used in Europe)—all visible on screen at once, roughly equivalent to 85 pixels per inch on a 21-inch display—in beautiful 24-bit color.

If you own a Centris 610 or a Quadra 610, or if you want to avoid covering up the PDS slot on a Centris 650, 660AV, or one of several Quadra models, you'll need to purchase a 7-inch card. (Developers say some of the forthcoming PowerPC Macs will be limited to 7-inch cards as well.) Among the shrunken few at press time were the cards in the Radius PrecisionColorPro series and the Futura and ColorLink cards from E-Machines. All other NuBus graphics cards are roughly 12 inches long, but SuperMac says it will phase in 7-inch cards in place of its current 12-inch products throughout 1994, but at least one high-end card—the GX•1360—won't get any smaller during the first half of the year.

Full-Color Conclusions

For sheer technological prowess, there's one obvious winner among the cards we tested: SuperMac's Thunder II GX•1360. Granted, it's a 12-inch card and it costs more than a new Quadra, but it combines the fastest QuickDraw acceleration with Storm Technology's DSP chips and special CMYK processing hardware. If you spend half your working days using Photoshop to retouch, filter, and composite full-color artwork—and you make money hand over fist doing it—then the Thunder II GX•1360 simply can't be beat.

If you're willing to sacrifice a little power to bring the costs out of the stratosphere but you still want onboard DSP for Photoshop work, take a look at SuperMac E-Machines' Ultra LX video card with the optional DSP daughterboard for $1799. If you can do without DSP, you can buy the Ultra LX for $1299.

The absolute best value for entry-level users trying to get a foothold in the world of 24-bit color is the Radius PrecisionColorPro 24XP. It maxes out at 832 by 624 pixels (the standard resolution for a 16-inch monitor), but many professionals can't afford to venture beyond 16-inch monitors. Radius also provides the best software of all the vendors for switching resolutions and bit depth on the fly (without restarting your Mac). Unlike SuperMac's software, for example, which requires you to cycle through resolutions and scroll around inside virtual desktops, the Radius utility lets you pick a specific resolution and promptly redraws the Finder desktop and all application windows to fit the new screen size.

The Radius and SuperMac E-Machines cards aren't the only bargains. Lapis also provides inexpensive cards. In fact, although it's unaccelerated, the Lapis ProColorServer 24x II roughly matches the speed of the Quadra 700's on-board video circuitry, yet it retails for $100 less than the Radius PrecisionColorPro 24XP. (Lapis's lack of on-the-fly resolution switching is what ultimately tipped my hand in favor of the Radius card.)

But don't be fooled into thinking you have to fork over more than $1000 to get 16.7 million colors, even if you use a 21-inch monitor. (Keep in mind that the prices in this feature are list prices. Street prices are often about 20 percent less.) Unless you want more Photoshop DSP or CMYK acceleration, steer clear of the $1300-and-higher crowd. Regardless of what claims a vendor makes for its enhanced QuickDraw acceleration, it's unlikely that you'll see enough of a speed gain to justify the inflated price. m

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Contributing editor DEKE McCLELLAND's books include *The Illustrator 5 Book, The FreeHand 4 Book* (both Peachpit Press, 1993), and the *Macworld Photoshop 2.5 Bible* (IDG Books Worldwide, 1993).

ACCELERATED 24-BIT VIDEO CARDS

MW EDITORS' CHOICE

Because of the small range in performance acceleration that professional graphic artists and publishing designers see in their day-to-day work, we put a high premium on price and extra features in picking the top accelerated 24-bit video cards.

Inexpensive Acceleration

PrecisionColorPro 24XP Of the cards that Macworld Lab tested, the 24XP represents the best value for people with 16-inch or smaller monitors. Radius also provides the best software for switching resolution and bit depth, and the 7-inch card is compact enough to fit inside any NuBus-based Mac, including future models. **Company:** Radius. **List price:** $599.

Full-Featured Acceleration

Thunder II GX•1360 The fastest QuickDraw display, 1360-by-1024-pixel screen resolution, optional DSP acceleration, and dedicated CMYK acceleration combine to make the GX•1360 the 24-bit powerhouse for heavy-duty Photoshop users. **Company:** SuperMac Technology. **List price:** $4499.

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*Based on an October 1993 independent benchmark study by MWA Consulting. **AplePrice as of 1/15/94 does not include Adobe PostScript Fax option. Actual retail prices may vary depending on location. © 1994 Apple Computer, Inc. All rights reserved. Apple, the Apple logo,

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Troubleshooting Tips

IT HAPPENS TO ALL OF US. You're working on a project, a deadline is near, and it's late at night or early in the morning. You turn on your Mac, and instead of observing the normal boot process, something goes wrong. That happy Mac face is no longer happy; it looks sad, and you see some strange numbers beneath that frown. Or you see a disk icon with a question mark, or a bomb message shows up before your Mac's desktop pattern appears.

Worse yet, perhaps you are just about to save your document after completing a long project, and your Mac freezes up, or you see the dreaded bomb message.

In any of these cases, you need to find out what's causing your problems so you can prevent further trouble. The causes fall into several categories.

INIT Conflicts

Many instances of Mac misbehavior are caused by a software conflict. If you are experiencing start-up problems or frequent crashes, the first thing to do is disable all your INITs (formally called extensions with the release of System 7).

To do this under System 7, restart while holding down the shift key. Your standard Mac start-up screen will show an "Extensions off" message. Under System 6, you can either disable your INITs manually, or restart your Mac with one of your system software disks.

If this solves your problem, the next step is to find out which INITs or extensions are causing the problem. If the problem persists, you may need to reinstall your system software to get rid of potentially corrupted files (see the sidebar "How to Reinstall a Clean System").

TIP: A quick way to isolate an INIT conflict (after disabling all INITs) is to restore your INITs in groups. Put back half the INITs and restart: if the conflict resurfaces, the problem INIT is in that group; if the conflict doesn't occur, the problem INIT is in the other group. Keep halving the group with the problem INIT until you whittle it down to the INIT or combination of INITs causing the problem.

TIP: By far the easiest way to manage the start-up programs in your Mac's System Folder is with an INIT-management program. Although their options vary, all INIT managers let you turn your INITs on and off as needed. The table "INIT Managers Compared" shows which managers offer what options.

One INIT manager, Casady & Greene's Conflict Catcher II, has an option that systematically turns groups of INITs on and off at each restart so you can isolate a conflict's cause.

If you want the no-frills approach, Apple's free Extensions Manager from Ricardo Batista is available through many online services, as well as from local user groups.

Sad Mac at Start-up

When you see a sad-Mac icon on your screen, beneath it will be a set of arcane numbers and letters. Rather than concentrating on the specific numbers, most Mac gurus look at the usual sources of the trouble, such as corrupted system software or a corrupted device driver. A device driver is a program, often hidden on your hard drive, that lets a device—say, a hard drive or printer—communicate with your Mac's CPU.

The quickest way to check for corrupted system software is to restart your

RALPH MERCER

and Tools

Mac with a floppy start-up disk, such as the Disk Tools disk that ships with System 7, or the System Tools or System Startup disks that come with System 6. If this solves the problem, it's time to reinstall your system software.

If the sad-Mac icon persists, you may have a corrupted hard-drive driver. If you've got any external SCSI components hooked up to your Mac, power down, and disconnect them all. Then start your Mac again. If the sad-Mac icon is gone, you may need to update the driver software on one of your external drives with a formatting program. If the trouble persists, you may want to examine your SCSI chain further. Check out the section on SCSI conflicts later on in this article.

BY GENE STEINBERG

TIP: If all of your troubles began when you installed a new peripheral, such as a hard drive, CD-ROM drive, or scanner, turn off your Mac and all its peripherals, and disconnect the new peripheral. Then see if your Mac starts up.

Software Incompatibility

Related to INIT conflicts are incompatibilities with System 7. Software not designed for System 7 may cause erratic behavior, including unexpected quits.

To identify such problems, Apple included Compatibility Checker with System 7; this HyperCard stack compares installed software against a database of known incompatibilities and informs you whether your software should work with System 7. It can even remove suspect INITs from your System Folder. But this approach is only as good as the database itself, and even the latest version (2.0) comes up short on such things as shareware and freeware, often erroneously reporting that the very newest software versions are incompatible, simply because they are not in the database.

Third-party developers jumped in with compatibility software, but only one remains in the market: Technosys's Help (which comes in $89.95 personal, $149 standard, and $199 network versions; 813/620-3494). (Baseline Publishing's DiagnoSys and Maxa Corporation's Alert have been discontinued.) Help uses the database approach and has some of the same limitations as Compatibility Checker. But Technosys offers quarterly subscriptions to updates to reflect new and updated software information.

TIP: The best way to avoid compatibility problems is to keep all your software as up-to-date as possible. Before installing any new software, check the Read Me files on the installation disks or look for special inserts in the manual or packaging that might discuss known software conflicts and workarounds.

HOW TO REINSTALL A CLEAN SYSTEM

When you reinstall the System, you update the existing System file; you don't replace it, although you do get a new Finder and other System-related files, such as Apple's control panels and INITs. But if the source of your troubles is your existing System file, the update process may not cure it, since the offending system resources may still be present. The answer may be to do a clean system-software installation. Here's how.

1. Check your start-up drive with Disk First Aid or a commercial diagnostic tool. System-software installation involves rewriting boot blocks to the drive, and moving and deleting several files. Thus, even minor directory problems can come back to haunt you when you reinstall these files.

2. If your hard disk is healthy, restart with your System 7 Disk Tools disk (if you're using System 6, use your System Tools or System Startup disks). Go to your hard disk's existing System Folder and remove the Finder. Rename the existing System Folder to Old System Folder or something similar.

If your hard disk had errors that could not be fixed, back everything up onto floppies or removable media and then reformat the drive. (Make sure you're using a formatter that's compatible with your version of the System; the formatter vendor can tell you if it is.) Reinstall the System (as described in Step 5) and follow the instructions in Step 2 again.

3. Restart your Mac again from the hard disk. If you don't see a floppy disk icon with a question mark on your Mac's screen, and the Mac boots normally, go back to your hard disk and look for a second System Folder. That itself can be the root of some of your troubles.

4. If there's another System Folder on your hard disk, restart your Mac with a floppy start-up disk. Unless that second System Folder has something you absolutely need, the best bet is just to trash it. (Make sure you check the files carefully first.) Then restart your Mac.

5. Place the first system-software-installation disk in the floppy drive, and start up your Mac from it. On System 6 disks, you have to launch the Installer application; with System 7, this application launches automatically. You have the option of an easy installation, which places the files needed by your Mac in a brand-new System Folder, or you can use the Customize option to add or remove features that you need, such as a specific printer driver or networking capability. If you're not sure what changes to make, select Easy Install.

6. When your System is installed, restart your Mac and make sure it works.

7. Once you're up and running, go back to the Old System Folder to restore your application-specific folders (such as the Aldus and Claris folders), preference files, INITs, and control panels. It is a good idea to drag your start-up items and INITs to your new System Folder in small groups (restarting each time) to make sure there are no conflicts you've missed.

8. Recheck everything in the Old System Folder before trashing it. Any System-related file (like an enabler) is probably present in your new System Folder, but everything else (including fonts and sounds) should be checked and double-checked so you don't throw away something you really need. (If you're uncertain about trashing it, first copy it to a floppy in case you do need files in it later.)

Viruses and Trojan Horses

When your Mac starts displaying odd symptoms, you might be inclined to suspect a virus or Trojan horse of some sort.

Although a couple dozen or so virus strains have emerged in the Macintosh world, only a few of them are really dangerous to your computer's performance or can cause it to crash or lose data.

As you use your Mac, the viruses may spread to other files. Exchanging disks that have infected files can result in the virus infection's affecting other Macs too.

The worst offenders are Trojan horses, which masquerade as utility programs but actually do such things as wipe out all the data on your hard drive.

In early 1991, there was a rash of reports of viruses, such as WDEF, that can sometimes cause your Mac to crash unexpectedly. But System 7's two desktop files are immune to desktop viruses, and a simple desktop rebuild (hold down the ⌘ and option keys when restarting) is all that's necessary to eradicate such viruses from your System 6 desktop.

To be safe, it's a good idea to get up-to-date virus-detection software. You've got a wide choice, from freeware utilities to commercial products, all of which offer a wide range of virus-detection and repair options. Freeware utilities (which are available from online services) include John Norstad's Disinfectant and Chris Johnson's GateKeeper; commercial products include Central Point Software's AntiVirus ($69.95, 503/690-8090), DataWatch's Virex ($99.95, 919/549-0711), Xelph's Rival ($79.95, 415/327-9563), and Symantec's SAM ($99, 408/253-3570).

TIP: Some virus detectors will offer to remove a virus from an infected Mac. But most virus-software authors suggest you instead replace the infected file from an uninfected copy, since the repairs don't always succeed, and you may be left with

INIT Managers Compared

Company	Product	Phone	Toll-Free Phone	List Price	Changes Start-up Order	Tests for Conflicts	Creates INIT Sets	Generates System Profile	Reports and Disables Problem INITs
Apple Computer	Extensions Manager 2.0.1	408/996-1010	800/767-2775	free	●	○	●	○	○
Baseline Publishing	INIT Manager 1.1.0	901/682-9676	800/926-9677	$59.95	●	○	●	●	●
Casady & Greene	Conflict Catcher II 2.0.2	408/484-9228	800/359-4920	$79.95	●	●	●	●	●
Viacom New Media	On Startup [A]	708/520-4440	800/877-4666	$99.95	●	○	●	○	○
Inline Software	INITPicker 3.0.2	203/435-4995	800/453-7671	$79.95	●	○	●	●	●
Now Software	Startup Manager 4.0.2[B]	503/274-2800	800/938-8669	$149.95	●	○	●	●[C]	●

● = yes; ○ = no. [A] Sold as part of On Cue II package. [B] Sold as part of Now Utilities package. [C] Generated by supplied Now Profile utility.

a damaged program that will crash or, at worst, won't run at all.

TIP: After you've found a floppy disk to be virus-free, lock the disk. A locked disk cannot be infected. By locking your program disks and emergency start-up disks, you practically eliminate the chances of reinfecting your Mac.

SCSI Conflicts

Some problems straddle software and hardware; these are often SCSI conflicts. For example, if your hard drive won't mount, you get a sad Mac, or if you have frequent disk errors, power down your Mac and disconnect all external SCSI devices. Check the cabling, SCSI address, and termination for possible problems. ("Hard Drive Rx," *Macworld*, December 1992, offers detailed advice for such hard-drive problems.)

Occasionally the rules of SCSI organization just plain won't work. For the longest time, my external hard drives would occasionally freeze up while writing a large file. (My system has two external hard drives, a removable drive, a CD-ROM drive, and a scanner.) After pursuing several false trails (including possible INIT conflicts, a possibly corrupted system file, and possible SCSI address conflicts), I found that I had to install *two* terminators: one a pass-through terminator on one of the CD-ROM drive's jacks, and the other at the end of the chain, where the scanner is installed. This fixed the problem (an admittedly unusual case), but hard-drive manufacturers I've talked to are very reluctant to recommend this method, because it may simply introduce new problems along the SCSI chain. If all other remedies fail, this may be a step to ponder as a last resort. Note, too, that when you hook up multiple SCSI devices to your PowerBook or Duo, you will actually need two external terminators.

TIP: When you install a new SCSI device, test it by itself on your Mac (with no other SCSI devices connected) to ensure that it works properly.

Hardware Problems

Although you can trace most of the circumstances where your Mac won't start up or crashes constantly to a software or SCSI-related problem, sometimes it is indeed the hardware that's at fault. If you've covered all other likely remedies, it's time to look at the hardware.

Some hardware difficulties are blatant: if the start-up process aborts with a series of chimes, or your Mac won't boot at all, a telephone call to your dealer or Apple's Customer Assistance Center (800/767-2775) may be in order.

If you want assurance that your Mac is working up to par, several software products are designed to put your Mac (and sometimes its accessories) through a battery of tests. MicroMat Computer Systems has three diagnostic utilities. MacEKG ($150) runs your Mac through a series of tests at start-up. DriveTech ($60) concentrates on testing the condition of your Mac's floppy drives. MicroProbe ADB ($99) tests your Mac's ADB ports.

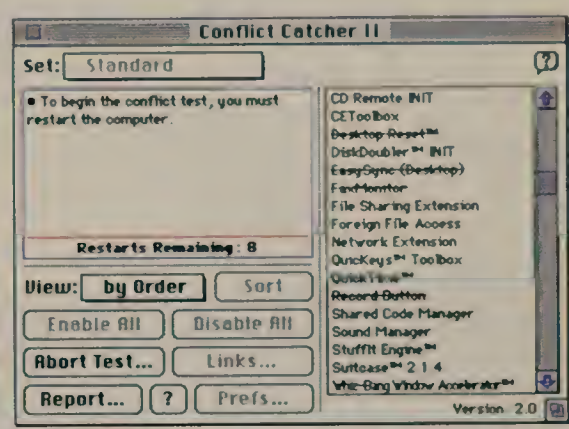
Diagsoft's $99 Peace of Mind tests a single hardware function (such as RAM or the SCSI port) or runs through a lengthy suite of tests. (Maxa's similar Snooper has been discontinued.)

Apple has its own software solutions for analyzing your hardware. MacCheck puts your computer and its attached SCSI devices through a series of basic performance tests, and it also provides a full test log and a profile of your Mac. These tests aren't as detailed as other companies' tools, but MacCheck has the advantage of being free as part of Apple's Software Utility Update (available direct from Apple, your dealer, or online services). Apple's MacTest Pro ($99, 408/996-1010) has many of the same diagnostic tests as the third-party software.

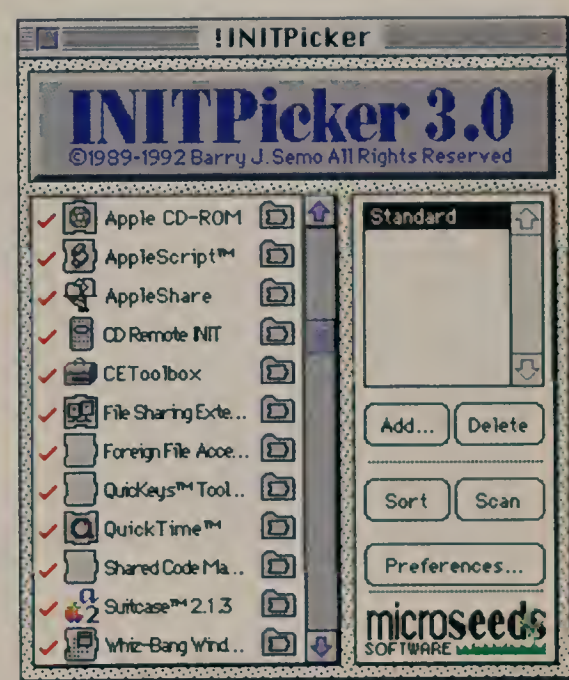
But do such programs really diagnose the condition of your hardware?

The Apple technicians I talked to consider such software to be mostly a set of confidence tests. What tests generally do, these technicians say, is compare your Mac's performance to an internal Apple benchmark set. If your Mac is working, the results will come close to (but not always exactly match) those benchmarks. If something is wrong, these tests show where the benchmarks fail or aren't up to snuff, and the programs use the results to suggest some possible causes.

But if something is seriously wrong with its hardware, your Mac probably won't start up at all, and you won't be able to run the software. For this situation



Automated INIT Testing Casady & Greene's Conflict Catcher II can automatically test groups of INITs to pinpoint which ones are causing problems.

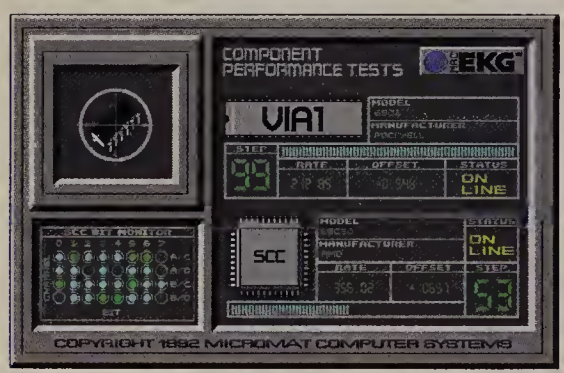


Proactive Conflict Management INITPicker from Inline Software (formerly Inline Design/Microseeds) lets you switch INITs on and off; it also includes a Bomb Guard feature (not shown) that disables INITs that crash at start-up.

Diagnostic Tools Compared

	APPLE COMPUTER			MICROMAT COMPUTER SYSTEMS			DIAGSOFT
	MacTest Pro 1.0.3	MacCheck 1.0.5	TechStep [A]	DriveTech 1.0	MacEKG 2.0.6x	MicroProbe ADB 1.0	Peace of Mind 1.3.3
General							
Phone	408/996-1010	408/996-1010	408/996-1010	415/898-6227	415/898-6227	415/898-6227	408/438-8247
Toll-free phone	○	○	○	800/829-6227	800/829-6227	800/829-6227	800/342-4768
List price	$99	free	$995	$60	$150	$99	$99
Includes start-up disks for Systems 6 and 7	● [B]	○	○	○	○	○	●
Hardware that tool checks							
Accelerator boards	○	○	○	○	○	○	● [C]
ADB	●	●	●	○	○	●	●
Cache cards	○	○	○	○	○	○	●
Clock	●	●	●	○	●	○	●
Floppy drives	●	○	●	●	○	○	●
Keyboards	●	○	●	○	○	○	●
RAM	●	○	●	○	●	○	● [D]
Hayes-compatible modems	○	○	○	○	○	○	●
Monitors	●	○	●	○	●	○	●
Mouse	●	●	●	○	●	○	●
NuBus	○	●	●	○	●	○	○ [E]
Printer	●	○	●	○	●	○	●
CPU	●	●	●	○	●	○	●
Parameter RAM	●	●	●	○	●	○	●
ROM	●	●	●	○	●	○	●
SCSI drives	●	●	●	○	●	○	●
Serial ports	●	●	●	○	●	○	●
Sound	●	●	●	○	●	○	●

● = yes; ○ = no. [A] *Available only to dealers and managers of large groups of Macs.* [B] *For System 7 only.* [C] *Limited to boards from DayStar and Radius.* [D] *Also tests composite SIMMs.* [E] *Checks data-transfer rate.*



Confidence Testing Programs Programs like MicroMat's MacEKG can check a Mac's hardware components to see if their performance matches Apple's specifications. That sometimes helps narrow down possible causes of problems.

Apple offers a more powerful set of tools, although distrbution is limited to dealers and administrators of large Mac networks. Apple's TechStep is a portable diagnostic lab that can put your Mac through a rigorous test of all its systems and can pinpoint hardware defects even on a component level. And it'll work even if your Mac won't start up. With the right ROM pack, it supports all Macs introduced through June 1993 (which includes the LC 520). But Apple will not produce ROM packs for Macs introduced after that (like the AV Macs and Quadra 605). For newer Macs, you must use Apple's MacTest Pro or another company's software.

TIP: When start-up stops after a series of chimes, it could just be a case of improper RAM installation. If you've just installed a memory upgrade, make sure the chips are properly seated. Sometimes removing and reinstalling SIMMs is sufficient to set things right.

Hard Disk Errors

If problems continue, the cause may be errors on your hard disk, such as missing data in the file hierarchy the Mac uses to track files. To find such problems, run your hard disks through Apple's Disk First Aid (included with your system disks) or one of the commercial drive utilities: Central Point Software's MacTools, which includes Central Point's AntiVirus program ($149.95, 503/690-8090; reviewed in *Macworld*, March 1994); DataWatch's SuperSet ($149, 919/490-1277), which includes the 911 Utilities and Virex programs; and Symantec's Norton Utilities for Macintosh ($149, 408/253-3570). Symantec/Fifth Generation Systems offers Public Utilities ($149, 504/291-7221), which, beginning in version 2.0, has added a backup utility (FastBack Express) to its arsenal of hard disk tools.

The DiskFix utility in MacTools gets particularly high marks from users, since it seems to fix more problems than Norton Utilities' Disk Doctor does, although it runs more slowly. However, you can't fix the disk from which DiskFix is running, which means you must run the utility from a floppy disk, which in turn all but disallows scheduled automatic disk-repair sessions.

TIP: When diagnosing your hard disk, the best approach is to use the emergency floppy disk provided with some repair utilities (or use another drive to start up your Mac). Sometimes directory repairs are done more effectively if the drive can be dismounted by the repair utility, and that can't be done if the drive is the one that boots your Mac.

Take a Deep Breath

If something goes wrong with your Mac, don't panic. Most often the problem will be solved easily if you just perform a few simple troubleshooting steps. Just take your time and follow the tips offered here, and very likely your Mac will soon be functioning normally once again. m

GENE STEINBERG contributed to David Pogue and Joseph Schorr's *Macworld Macintosh Secrets* (IDG Books Worldwide, 1993).

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Circle 14 on reader service card

They put a big red crayon in your hand.

Now what? Aa Bb Cc Dd Ee Ff. Again and again. Is it K or Ꝁ? May I go to the bathroom, please? Reeeecess!

But slowly letters became words, words became sentences, sentences became paragraphs, and paragraphs became a report on Gems of the World. C+.

Later, you tried $10 words. Sometimes they worked. Sometimes you were accused of malapropism. *Mala-what?* But somehow after four years of English Comp and a million term papers, you finally got it.

And nothing can keep your writing more articulate and concise than the new WordPerfect® Mac 3.0. Twenty-seven innovations make it the most comprehensive, most Macompatible® word processor anywhere. Class dismissed.

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Top Utilities

Macworld picks the best productivity enhancers

I'VE BEEN REMODELING THE HOUSE I'VE lived in since about the time the Macintosh was introduced. I love my house, but there's no question that the place could stand a little work. The question is whether or not I'll go bankrupt making the improvements. The Macintosh could also benefit from a little work. Fortunately, unlike the materials for most home improvements, utility software, which lets you refine the way your Mac works, comes in small boxes and doesn't cost a lot of money.

Picking the best Mac utility software is no small task. There are hundreds of ways to customize your Mac. But given a basic standard by which to judge a utility—it should enhance your productivity; boost your efficiency; and save you time, effort, and/or money—I have chosen 16 particularly useful and effective utilities from a 7-foot-high shelf of software.

Utility software shouldn't require a large investment, so my instructions were to never (well, hardly ever) discuss utilities that cost more than $100. I also avoided utilities that fall into specialized categories, such as hard-drive optimizers (see "Hard-Drive Optimizers," *Macworld*, March 1994); safety-net utilities such as antivirus, backup, and file-recovery programs (which will be evaluated in future articles); PowerBook-specific utilities (see *PowerBook Notes*, November 1993); and file-compression programs (see "Real-Time Compression," *Macworld*, August 1993). You might think that this elimination round left me with nothing to write about. Think again—to pick the top utilities, I evaluated dozens of menu-enhancement programs; fast file and folder finders; application launchers; background file copiers; font, desk-accessory, sound, and system-extension managers; printer enhancements; and more. Only the best (or nearly the best) of breed are listed.

Menu Makeover

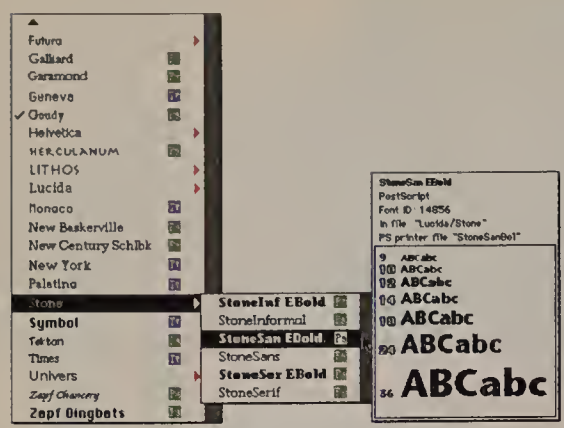
For those of us who haven't the mental storage capacity to commit every key command to memory, the Finder's mundane menu mechanics—the lack of hierarchical menus (submenus) and the inability to add or change key commands, reorder menu items, or open menus automatically (without clicking)—needs improvement.

A number of Mac menu-enhancement utilities exist, but three products stand out: NowMenus (part of Now Utilities, from Now Software, 503/274-2800, $129), HAM (from Inline Software, 203/435-4995, $79.95), and Kiwi Power Menus (Kiwi Software, 805/685-4031, $39.95). HAM, Kiwi Power Menus, and NowMenus all add hierarchical menus to the Apple menu; HAM and Power Menus can reorder items in the Apple menu. However, while HAM and Power Menus concentrate only on the Apple menu, NowMenus also improves Macintosh menus in general.

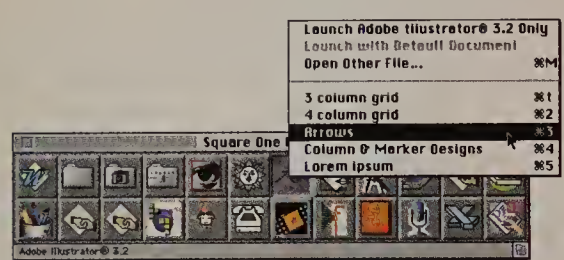
With NowMenus, for example, you can quickly add a key command to any menu item that lacks one (such as Make Alias in the Finder). NowMenus can also open a menu for you when the pointer is over the menu title (no click-and-drag required), change the font and font size used in menus (Power Menus can do this for the Apple menu only), automatically hide the windows of applications in the background, assign one application to open documents created by another (one you don't own, for example), install a Launch menu (pull-down or pop-up) for listing and launching the applications and documents you use

by Robert C. Eckhardt

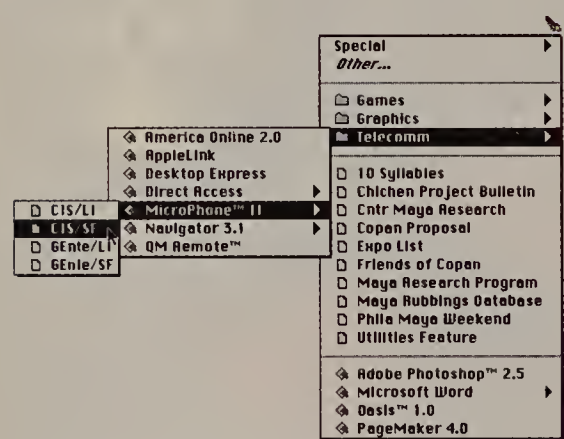
NEW AND IMPROVED
F1
THE UTILITIES
BEFORE
THE UTILITIES
...AND OH, SO FAST!
F5
I NOW HAVE TIME TO SOCIALIZE



Instant Font Info Move the pointer into the gray bar along the Font menu's right edge and MenuFonts displays samples of the selected font plus useful technical information.



Starting from Square One In addition to application icons, the Square One palette can contain icons for groups of items, such as frequently used folders, control panels, and QuicKeys macros. You can attach frequently used files to individual application icons and launch application and document together using the icon's pop-up menu or a simple key command.



Organizing with On Cue Both applications and documents can be arranged in submenus in the On Cue II launch menu for easy access. User-defined categories (such as the three near the top of this menu) simply organize items into logical groups. Frequently used documents can be appended to the appropriate application (as in the MicroPhone submenu shown here). And On Cue multisets contain work-related files that are all launched with a single menu selection.

most often, create sets of documents and applications that launch together, and more. NowMenus does show a few rough edges (it cannot reorder desk accessories installed with Suitcase, for example).

But overall, NowMenus gives the Macintosh a better menu makeover than any other utility.

The Font menu presents a unique set of problems and requires the attention of a utility specifically designed for it. MenuFonts (Dubl-Click Software, 818/888-2068, $69.95) is the best choice here. Like Adobe Type Reunion, MenuFonts groups fonts by family in submenus and eliminates the style prefixes that often plague large font families. Like WYSIWYG Menus (another part of Now Software's Now Utilities), MenuFonts can draw the font names in a Font menu each in its own typeface (or in your choice of typeface, size, and color). MenuFonts, however, also includes several other handy features not found in either Type Reunion or WYSIWYG Menus. With MenuFonts, you can scroll the font menu by using the arrow keys or by typing the first letter of the desired font. Font names are followed by icons that indicate whether they are PostScript, TrueType, or bitmap (see "Instant Font Info").

Let Your Macros Do the Typing

QuicKeys (CE Software, 515/221-1801, $169) is one of the most popular Macintosh utilities. And deservedly so. When you watch QuicKeys perform time-consuming and repetitive tasks with a single keystroke, you see the essence of the computer as a productivity tool.

QuicKeys remembers the steps of complex tasks that you perform frequently. You assign each set of steps (or macro) a trigger—a key command, a menu or palette item, or a special icon in the Finder—and from then on, whenever you pull the trigger, QuicKeys performs the task for you. The tasks QuicKeys performs can be as simple as assigning a key combination to a command that lacks one; inserting a date, time, address, or other piece of text; or launching an application or desk accessory. Tasks can be as complex as copying an address in your address book and inserting it in the correct place in a document in a different application. You can tell QuicKeys how to perform each task step-by-step, or QuicKeys can record the macro by watching you perform the task once. QuicKeys requires more study and practice than most utilities, and it costs more, but it's definitely worth both the price and the effort.

Find Files Faster

Many utilities feature modules for fast launching of files and applications. But two utilities have carried file launching to an art form: Square One (Binary Software, 310/451-9044, $74) and On Cue II (Viacom New Media, 708/520-4440, $99.95). Square One approaches the problem with icon-filled palettes. The main Square One palette provides access to applications and documents via icons, keyboard combinations, and pop-up menus (see "Starting from Square One"). In addition, you can drop any document on the Square One icon and it will respond with a list of compatible applications; click on the desired program and the file opens. Also, Square One has an active application palette that automatically appears when you place the pointer in a corner of the screen (as long as After Dark isn't running, at any rate). One click on an icon in the palette brings to the fore the designated application, desk accessory, or the Finder. Square One has some drawbacks, including its less-than-helpful manual, the way you must specify QuicKeys macros (you must type the full macro name manually), and the fact that it uses 400K whenever it's running (and it should run all the time to be effective). But if you prefer to point and click, you won't find a better file-launching utility than Square One.

By adding a launch menu to the menu bar, On Cue II takes a more typical approach to fast file-launching than Square One. On Cue II's launch menu—which is available from the menu bar or as a pop-up menu—is thoughtfully and elegantly designed. It can contain applications and documents arranged in any order and set off by any number of dividers, it can list documents in submenus, and it can group applications and documents in submenus (see "Organizing with On Cue"). Key commands and a readily accessible menu editor make it easy to set up and change the menu. On Cue II also provides key commands for switching between open applications, can reset the default folder (the one a program looks in first) for any application on its menu, and comes with On Startup, a start-up–file manager, and On Disk.

On Disk adds lists of files, folders, and disks, plus a variety of useful file-management tools (including a Make Alias command and a powerful Find feature), to all Open and Save dialog boxes. On Disk can also retool Open and Save dialog boxes so they act more like Finder windows (see "Finder in a Box"). And best of all, On Cue and On Disk share information, so any files appended to an application in the On Cue menu, for example, automatically appear in the On Disk file list in that application's Open dialog box.

Copy Files Quicker

Copying is one of the Mac's last great productivity bottlenecks; if the Mac can print in the background and telecommunicate in the background, why can't it copy files and empty the Trash in the background, too? Well, it can, but it needs a little help from a utility. My

Judging from the pile of products I've had the pleasure to plow through lately, humorous Macintosh utilities constitute a major growth industry. Take sounds, for example. You can add sounds to almost any Macintosh event (ejecting a disk or opening a window, for example), and you have a wide variety of sound-clip collections from which to choose. My favorite sound utility is Kaboom (Nova Development Corporation, 818/591-9600, $49.95). It works with 22 different Mac events, and has a built-in sound editor so you can trim sounds that are too long or glue several sounds together. It also contains a fine collection of sound bites, including a basic selection of boos, bells, and boings, plus Lucy (the "Vitametavegamin girl"), Ricky ("Oh no you dunt!"), and Richard Nixon ("I am not a crook"), to name a few.

Once you get hooked on wacky sounds at odd moments, you'll crave a wider selection. I like the More Kaboom collection ($39.95) for its kookiness—Dennis the Menace ("Jeepers!"), Ralph Kramden ("Pow, right in the kisser!"), Mr. Ed, and Woody Woodpecker, among others—and the AudioClips collections (Sound Source Unlimited, 805/494-9996, $49.95 each), which cover "Star Trek" (both the original and "The Next Generation"), *Star Wars*, and *2001: A Space Odyssey* ("I'm sorry, Dave, I'm afraid I can't do that").

Once you've got your sonic alerts in order, that old gray desktop pattern begins to look somber by comparison. No problem. Use Screenscapes, Chameleon, or Wallpaper to splash Technicolor patterns across your desktop. Screenscapes (Kiwi Software, 805/685-4031, $40) and Chameleon (Logical Solutions, 612/659-2495, $59.95) use no memory, won't conflict with any of your control panels or extensions, and include eye-popping collections of seamless patterns from marbles of all kinds to brickwork, pebble beaches, and new-age neon abstracts. My favorite is Wallpaper (Thought I Could, 212/673-9724, $59.99), however, primarily because it makes modifying existing patterns, copying patterns from elsewhere, and drawing new patterns so easy (see "Fun In, Fun Out").

Expensive marble and embossed leather desktops beg for a few first-class accoutrements. So how about lush tropical greenery sprouting through the cracks between your marble tiles, or butterflies (or pixies) flitting effortlessly around and under your desktop icons and windows as you work? These and other entertaining effects are possible with UnderWare (Bit Jugglers 415/968-3908, $59.95), a three-part utility that contains a dynamic desktop, a screen saver, and a relatively barebones desktop pattern module (display only, no editing). The dynamic desktop animations include a klutzy Tarzan; a tutued ballerina; a frenetic, hyperglycemic nerd; a masked bandit; and more. UnderWare's desktop animations run only when there's nothing else going on, but beware: they can be both addictive and distracting.

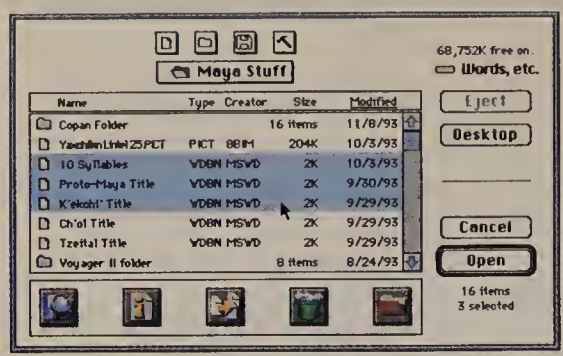
I thought UnderWare's dynamic desktop was something, until I saw its screensaver modules: a garbage truck comes and carries off the Trash Can; a dragon incinerates whatever it encounters; a burglar blows a hole in your desktop and makes off with a microprocessor; files and folders sprout legs and run away, or join together and scissor-kick Rockette-style; icons launch themselves like rockets. In terms of liveliness and animation quality, UnderWare's screen savers are matched only by The Disney Collection Screen Saver (Berkeley Systems, 510/540-5535, $49.95). Though some of the modules in the Disney Collection are strictly for kids, others—for example, Mickey Mouse's classic rendition of the overworked sorcerer's apprentice, Goofy's horseplay with windows and icons, Donald Duck's energetic attempts to repaint the screen, and Scrooge McDuck's parody of flying toasters (with flying money this time, of course)—can be enjoyed by those of us who still won't grow up.

Fun In, Fun Out Comprehensive desktop fun starts with changing the desktop pattern with Wallpaper; its bitmap-editing screen and pop-up tool menu are on the left side of the control panel, and a palette of most-often used patterns is on the right. Custom icons, like the drive icons on the right, go together well with a custom desktop; a small selection of Icon 7 custom icons appears in the window on the left.

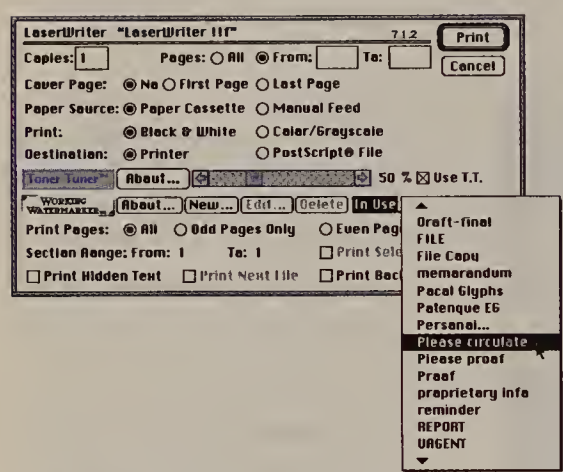
Custom icons are yet another desktop diversion. Although I have yet to find the perfect icon editor, Icon 7 (Inline Software, 203/435-4995, $79.95) comes close. For the artistically challenged, Icon 7 now includes a large library of high-quality, colorful icons. Unfortunately, the collection is heavily biased toward folders (see "Fun In, Fun Out"); if you want document or disk drive icons, you'll probably have to make your own or appropriate them from elsewhere with Icon 7's Transmogrifier application.

If foolishness of a comprehensive sort appeals to you and your budget is limited, check out the five modules bundled together in NowFun (Now Software, 503/274-2800, $69). FunScreenSavers is a standard screen-saver package that also runs After Dark modules. FunPictures lets you replace the desktop pattern with one full-screen picture or a mosaic of pictures. FunSounds is a sound utility; unlike Kaboom, FunSounds doesn't contain a sound editor, but it does offer a more comprehensive list of events to which sounds can be attached. FunCursors replaces standard-issue pointers with colorful, animated cursors such as rotating globes, jugglers, steaming cups of coffee, and barber-pole-striped arrows. FunCursors also has a cursor editor with which you can modify existing cursors or create new ones. And finally, FunColors lets you change the color of menus, dialog boxes, window elements (title bars, scroll bars, and so on), and buttons.

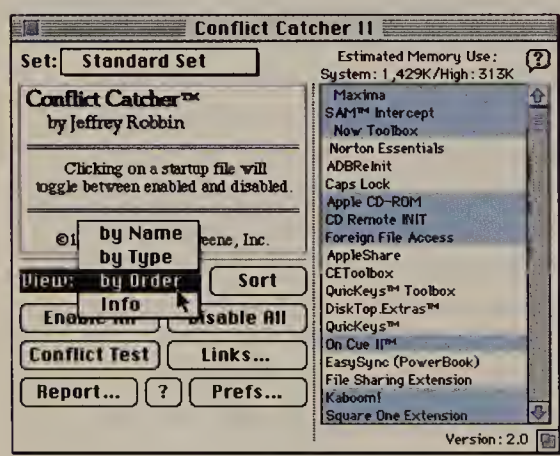
Remember that silly utilities are like junk food: once you start, you can't stop, and when you finally do stop, you're uncomfortably stuffed. By the time I was finished testing products for this sidebar, for example, I had acquired a great computer toy, but devoured a major chunk of hard disk space and a significant amount of RAM. Have fun, but don't forget to say "when."



Finder in a Box On Disk adds Finder-like abilities to Open and Save dialog boxes, so you can list files by size, kind, or date (as shown here); select and open several files at once; get info on or search for files; make new folders; and toss files in the Trash—all without leaving the dialog box.



New Print Options Toner Tuner adds a scroll bar to the center of the Print dialog box; use it to specify a still readable shade of gray for draft copies. With Working Watermarker, you choose the desired watermark from a pop-up menu. Each watermark prints at a user-defined shade of gray and appears on all pages, the first page only, or all but the first page. You can also link two watermarks, one for the first page, the other for all other pages.



Loading Up at Start-up Conflict Catcher II lists start-up items in loading order, in alphabetical order, or by file type; and it displays a running total of the memory required for all selected start-up items.

favorite is CopyDoubler (Symantec Corporation, 408/253-9600, $59.95), which essentially grabs all copying and Trash-emptying chores from the Mac and hands them to a small program that runs only long enough to do its work. Symantec says that this program is faster than the Finder. But the real point is that it runs in the background, so you are free to work anywhere or do anything else.

You can specify any number of copying tasks one after the other and pile on Empty Trash commands as well. The CopyDoubler status window shows the progress of each copy request, much as the Finder does, but also identifies the task according to the first file or folder copied and indicates how many more copying jobs remain in the queue. CopyDoubler also verifies copies to hard drives and removable cartridges (the Finder verifies only copies to floppies), renders trashed files unrecoverable (for the security conscious), and schedules copying at specific times (at regular intervals or following a specified event).

Printer's Helpers

If you have diverse printing needs, you have a variety of printing utilities from which to choose. For example, I was never able to get a decent envelope out of my LaserWriter until KiwiEnvelopes came along. Now, several years later, KiwiEnvelopes 3 (Kiwi Software, 805/685-4031, $49.95) is still the best way I know to print envelopes. It prints bar codes and bottom-of-envelope messages as well as mailing and return addresses, and provides domestic and international postal rates, too.

KiwiEnvelopes allowed me to put my electric typewriter in storage, and with Working Watermarker (Working Software, 408/423-5696, $49.95), I have finally thrown away my ink pad and collection of rubber stamps that say COPY, URGENT, and so on. Working Watermarker can print text or graphics in a user-defined shade of gray "behind" any document (see "New Print Options"). Working Watermarker has many uses, including putting not-so-subtle notices (such as DRAFT or CONFIDENTIAL) behind a document's text, adding unobtrusive graphics on title pages, and creating different letterheads for different documents.

Toner Tuner (Working Software, 408/423-5696, $24.95) is one of those rare pieces of software that actually reduces the drain on my bank account. Like Working Watermarker, Toner Tuner adds another option—printing your document at something less than full black—to the Print dialog box (see "New Print Options"). You simply click on the Use T. T. check box, select the desired percentage of black, and print as usual. The quality and darkness of the resulting type will depend on the printer and driver you are using, but most people should find that light to medium gray provides readable draft copies. The point, of course, is a significant reduction (about 50 percent) in laser printer toner or inkjet printer ink consumption.

Adobe Type Manager (Adobe Systems, 415/961-4400, $60) has the distinction of being one of the most frequently forgotten utilities. ATM is often forgotten because once you install it you never have to think about it again. It performs its two main tasks flawlessly. Using the PostScript character definitions, ATM generates the characters you see on screen when standard screen fonts for that size are not available. In most sizes, the results are a sight to behold. And it creates near-laser-quality PostScript type for use by non-PostScript printers. If you don't yet use it, don't forget: For anyone who works with PostScript fonts, ATM is essential.

A Utility to Manage Utilities

Install just a small fraction of the control panels and system extensions available, add a set of fonts and useful desk accessories, and you would need to be a genius to keep them all in order and functioning smoothly. If you're not a genius, you can probably get by with one or two utility programs: a manager for fonts and desk accessories and a start-up manager.

Since System 7 has eliminated the need to install desk accessories and fonts in the System file, why, you may wonder, bother with a manager for fonts and desk accessories? Well, if you don't have many fonts or desk accessories, that's a good point. But if you are a compulsive font and/or desk-accessory collector, either Suitcase (Symantec Corporation, 408/253-9600, $79) or MasterJuggler (Alsoft, 713/353-4090, $49) is a good way to keep your Font and Apple menus tidy. With either of these programs running, you can have a basic set of fonts and desk accessories available at all times (by storing them in the Fonts and Apple Menu Items folders), and you can load special-purpose ones (which can be stored anywhere) only when you need them. You can define sets of fonts and desk accessories that can be loaded or removed as a group with one or two keystrokes. And both programs can help resolve font ID-number conflicts and can load sound files (which must normally be stored in the System file) the same way they load fonts and desk accessories.

If you're hooked on start-up files, a start-up manager is a must—too many start-up files all turned on at the same time eat up RAM and can cause conflicts, a polite term for crashes. (For more on preventing crashes, see the feature "Troubleshooting Tips and Tools," in this

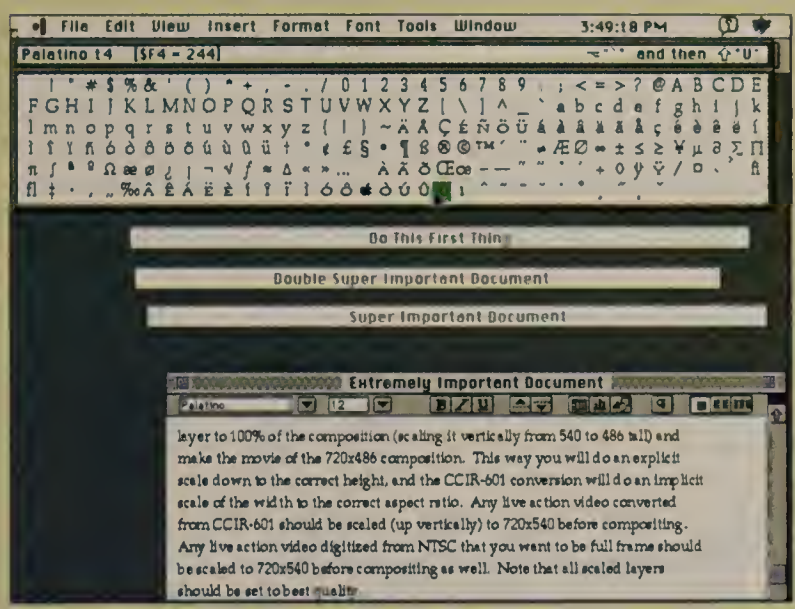
Having the right tools when you set out to remodel your Macintosh is crucial. Unlike tools for home repairs, though, some tools for customizing your Mac just are not available at the store. You may find that the right utility exists only in the form of shareware—software that you can try out and then pay the author for if you find it useful—and freeware, which (as you would expect) costs nothing. While hundreds of freeware and shareware utilities exist, I have whittled the list down to 11 utilities that deserve a spot in your software toolbox.

AppDisk 1.6.1 lets you use some of your RAM as if it were a really fast hard drive. Unlike many software RAM disks, AppDisk doesn't require you to restart your Mac to launch or resize the RAM disk. To provide data security AppDisk can periodically save its contents back to your hard drive. AUTHOR: MARK ADAMS. FEE: $15.

MacErrors 1.0 deciphers Apple's cryptic error messages. What is error type –34? MacErrors reports it's a disk-full error. OK, so it's not as good as having a programmer sitting next to you, but at least you'll get some idea what's gone wrong. AUTHOR: MARTY WACHTER. FEE: FREE.

PopChar 2.6.2 lists every character available in your current font. Just click on the character you want, and PopChar inserts it where you left your cursor. No more struggling to remember the key combination for §. No more hunting with Key Caps for Σ. PopChar shows the keystroke combination for the selected character so next time you can enter the character directly from your keyboard. AUTHOR: GUNTHER BLASCHEK. FEE: FREE.

PwrSwitcher 1.1.2 lets you switch between active programs with your power-on or escape key instead of with your mouse and the Finder's application menu. Hit the key to bring the next application on the menu forward. AUTHOR: DAVE LAMKINS. FEE: CHARITABLE CONTRIBUTION REQUESTED.



Shareware System Enhancements PopChar's box (at the top of the screen) gives you easy access to every character in the current font. In the middle of the screen, WindowShade lets you access the title bars of every open document or window. Zipple lets you add a variety of items to the menu bar. Here, spinning rods and a spinning question mark replace the Apple icon and balloon-help icon, respectively.

SCSIProbe 3.5 identifies and mounts any SCSI device connected to your Mac. It shows the device's SCSI ID, type, vendor, name, and version. Install SCSIProbe's INIT on removable cartridges and the cartridges mount automatically. SCSIProbe makes Mac SCSI a blessing instead of a curse. AUTHOR: ROBERT POLIC. FEE: FREE.

SpeedyFinder7 1.5.9 makes System 7's Finder as fast as it ought to be. It speeds up Finder copying, window opening, file renaming, Trash emptying, and other things that System 7 alone does too slowly. SpeedyFinder can also rebuild the desktop without restarting, add color to floppy-disk icons, and add key commands to Finder functions. AUTHOR: VICTOR TAN. FEE: $20.

StuffItExpander 3.0.7 decompresses AppleLink packages, Binhex files, Compact Pro archives, and StuffIt archives. That covers most everything you'll find online. It supports drag-and-drop files, folders, and disks in System 7. It can expand files in the background, and it periodically checks a special Watch folder, expanding any files that it finds there. AUTHOR: ALADDIN SYSTEMS. FEE: FREE.

SuperClock 4.0.4 sticks a digital clock in your Mac's menu bar. Click on it to get the date; click again to get a stopwatch. If you use a PowerBook, SuperClock lets you keep an eye on power by adding a small battery gauge to the menu bar. AUTHOR: STEVE CHRISTENSEN. FEE: CHARITABLE CONTRIBUTION REQUESTED.

UltraFind 1.0.3 will find and move just about any Mac file. For example, UltraFind can search your hard drive and network volumes for all TIFFs larger than 5MB that were modified with Adobe Photoshop in October. It can copy those files to an optical cartridge and then delete the originals. It also searches by specific words or phrases within files. If UltraFind can't find it, then it probably doesn't exist. AUTHORS: JULIAN AND STEVE LINFORD. FEE: $37.

WindowShade 1.2 lets you roll up open document windows, leaving just the title bar showing. It's an easy way to keep several different documents available without cluttering your desktop. Click on the title bar and the window opens and becomes active. AUTHOR: ROBERT JOHNSON. FEE: FREE.

Zipple 1.9.1 adds animated figures to your menu bar. You can replace the Apple icon with Bart Simpson's spinning head, or create your own Zipple. Now you can experience the same sort of ingenuity that enlivens screen saving whenever you use your Mac. OK, it is not a productivity enhancer, but Cool Zipples are spreading like weeds online. AUTHOR: CHRISTOPHER SULEY. FEE: $10.

Unregistered copies of these programs are available from online services such as America Online and CompuServe as well as through user groups. This collection of shareware and freeware is also available for $4 through BMUG (800/776-2684). If you decide to keep any shareware program, be sure to pay its registration fee. That way, shareware authors can afford to keep providing tools that make the Mac even easier to live with.

—Jim Feeley

CHEAPER BY THE DOZEN

Perceptive software publishers have noticed that utilities can be as addictive as chocolate. To feed our habit, they've compiled ready-made collections of utilities, the software equivalent of Whitman's samplers. The problem is, like Whitman's samplers, every collection is a mixed bag of wanted and unwanted offerings. If you like the labor-saving aspect of prefab collections, the trick is finding the bundle with the highest proportion of choice choices.

7th Heaven, Super 7 Utilities, and CDU offer an assortment of appealing and not so appealing utilities. 7th Heaven (Logical Solutions, 612/659-2495, $79.95) includes Chameleon (my least favorite desktop-pattern utility), a calendar, a set of color replacement icons for System alerts, a simple screen saver, and three other even less appealing utilities. If Chameleon were a box of chocolates, I'd hesitate giving it to my brother-in-law's second cousin.

Super 7 Utilities' seven control panels (Atticus Software Corporation, 203/348-6100, $99.95) include three small but superior items: a utility that automatically deletes the aliases of items that are thrown in the Trash (why didn't Apple think of that?); tear-off menus for those with screens big enough to display them; and a modification of balloon help that replaces the Help menu with user-defined key commands. Connectix Desktop Utilities, or CDU (Connectix Corporation, 415/571-5100, $99), consists of 12 modules regulated from a single control panel, and it, too, deserves decidedly mixed reviews. The high points are modified balloon help like that in Super 7, menu and dialog-box navigation from the keyboard (including menus that drop automatically, without waiting for you to press the mouse button), a simple screen saver, a simple security system, and a file-update and file-synchronization module for people who keep duplicate sets of files on two or more computers or in several locations.

If Super 7 and CDU were chocolate samplers, I'd probably keep them around for guests to pick at. Now Utilities (Now Software, 503/274-2800, $129), on the other hand, is something I'd share with my significant other. Now Utilities is the elder statesman of basic utility collections; currently in its fourth incarnation, it has had time to ripen with age. Not surprisingly, of its seven components, five are first-class. Startup Manager is an excellent start-up–file manager. Overall, WYSIWYG Menus is a slightly less sophisticated version of MenuFonts; however, WYSIWYG adds two features MenuFonts lacks: it can reorder fonts and temporarily remove installed fonts from the Font menu. NowMenus is one of the best menu utilities around; NowSave is a combination autosave and keystroke capture (à la Last Resort) utility. And Super Boomerang adds lists of frequently used files and folders to Open dialog boxes, the Apple menu, and any application menu; Super Boomerang can search both for and inside files from an Open dialog box. As is usual for Now software, the manual is way too long, but who's complaining when you get so much for your money?

At press time, Aladdin Desktop Tools (Aladdin Systems, 408/761-6200, $89.95) was not completely cooked (it should be fully baked by the time you read this), so I was unable to give it a thorough taste test. But the morsels I have tried are so, well, appetizing, that I couldn't resist serving it up here.

Desktop Tools combines some of the best ideas of a variety of existing utilities and adds some new ideas of its own. Among its many abilities are background copying and trashing (including security-conscious deletion) of files; adding a list of frequently used files and folders and a Find command to Open and Save dialog boxes; icons that support drag-and-drop printing to specific printers (without requiring you to go to the Chooser); disk icons that show their type (Mac or PC), size, and locked or unlocked status; calculating the combined sizes of groups of files; creating folder icons emblazoned with the icons of your applications; an intelligent Make Alias command that saves the alias to the desired folder—without the *alias* suffix; and improved balloon help. All this and quite a bit more at 70 percent of the price of Now Utilities. If Desktop Tools were a chocolate sampler, it would be a box of Teuscher truffles and I'd probably eat them all myself.

issue.) If you deal with a large number of start-up files, the choice these days is Conflict Catcher II (Casady & Greene, 408/484-9228, $79.95). You can use Conflict Catcher II for all the standard start-up manager services: to change the order in which start-up items load, to load or disable specific items at start-up, and to organize start-up items into task-related sets (which can be invoked at start-up with a single keystroke). In addition, Conflict Catcher II can manage the items in your Startup Items and Fonts folders. It can display information about each item, including version number and memory requirements. Conflict Catcher II automatically disables start-up items that bomb during start-up and offers a built-in conflict test sequence that greatly helps locate less self-evident problems. All this is rounded out by some unique touches (see "Loading Up at Start-up"), including the ability to recognize (and notify you) that there are multiple copies of the same start-up file in your System Folder.

The Last Resort

The last word on utilities is Last Resort (Working Software, 408/423-5696, $49.95). It quietly stores your keystrokes in text files (one for each work session) tucked away in the System Folder. If you work primarily with text documents, and disaster causes you to lose important work that you haven't saved, or if you can't remember where you added a piece of information but you remember when, you will find it in Last Resort's keystroke file. If you write the way I do (that is, write, edit, and rewrite all at the same time), Last Resort's file copy will be a tangled mess. Last Resort does not delete old keystroke files automatically, so it's easy to accumulate a huge number of useless files. But useless old files and tangled messes seem insignificant compared with the ways Last Resort can save your behind.

Not Quite All

It would be nice if I could say "That's all, folks," but you can't get off the hook that easily. There's always a new group of utilities that offer an easier or faster way to get the job done. And as in designing a new look for your home, your choices have a lot to do with personal taste. One user's must-have utility is a waste of time to another. While the products listed here may not fill all your needs, this listing of *Macworld*'s favorite utilities offers a strong foundation to build on. **m**

ROBERT C. ECKHARDT is a *Macworld* contributing editor. When not searching for a utility that will manage all his utilities, he can be found exploring Mayan ruins.

Think

	COMPANY	ADD1	CITY	TEL	HOURS
1	Macy's	Clifton Center, Wolf Rd.	Albany	555-3865	M,T,W 10-6; Th-Fr 10-9
2	Audio Lab	298 Congress St.	Troy	555-2860	M,T,W 10-6; Th-Fr 10-9
3	Radio Shack	110 Watervliet Ave.	Watervliet	555-1125	M,T,W 10-6; Th-Fr 10-9
4	Lechmere	89 Federal Way	Albany	555-7927	M,T,W 10-6; Th-Fr 10-9
5	Dalton's Audio	310 State Street	Albany	555-4500	M,T,W 10-6; Th-Fr 10-9
6	B.J.'s Wholesale	97 Third St	East Greenbush	555-5091	M,T,W 10-6; Th-Fr 10-9
7	Hippo's	1500 Central Ave.	Albany	555-5538	M,T,W 10-6; Th-Fr 10-9
8	K-Mart	80 Washington St	Rensselaer	555-1519	M,T,W 10-6; Th-Fr 10-9
9	Elmere	Village Plaza, Rt. 146	Schenectady	555-9047	M,T,W 10-6; Th-Fr 10-9
10	Ernest's Stereo	76 O'Brien Way	Louisville	555-4230	M,T,W 10-6; Th-Fr 10-9
11	Caldor's	1423 Heath St.	Albany	555-1987	M,T,W 10-6; Th-Fr 10-9
12	Coco's	Northern Plaza, Rt. 152	Albany	555-2921	M,T,W 10-6; Th-Fr 10-9
13	Belton Stereos	150 State Street	Troy	555-1473	M,T,W 10-6; Th-Fr 10-9
14	Concord Audio	1999 Railroad Ave.	Albany	555-0200	M,T,W 10-6; Th-Fr 10-9
15	Radio Shack	872 Johnson St	Watervliet	555-0711	M,T,W 10-6; Th-Fr 10-9
16	K-Mart	89 Albany Street	Albany	555-2205	M,T,W 10-6; Th-Fr 10-9
17	Hippo's	45 Wadsworth Circle	Menands	555-6099	M,T,W 10-6; Th-Fr 10-9
18	Sam's Club	870 Central Ave.	Albany	555-3155	M,T,W 10-6; Th-Fr 10-9
19	Audio Lab II	1145 Lawler Ave.	Albany	555-8049	M,T,W 10-6; Th-Fr 10-9
20	Wilton Stereo	189 Central Ave	Albany	555-4995	M,T,W 10-6; Th-Fr 10-9
21	Caldor's	45 Branch St	Colonie	555-8606	M,T,W 10-6; Th-Fr 10-9
22	Rettig's Stereo	2764 Consort Rd.	Schenectady	555-8424	M,T,W 10-6; Th-Fr 10-9
23	Homer's	619 Crusty Way	Louisville	555-1965	M,T,W 10-6; Th-Fr 10-9

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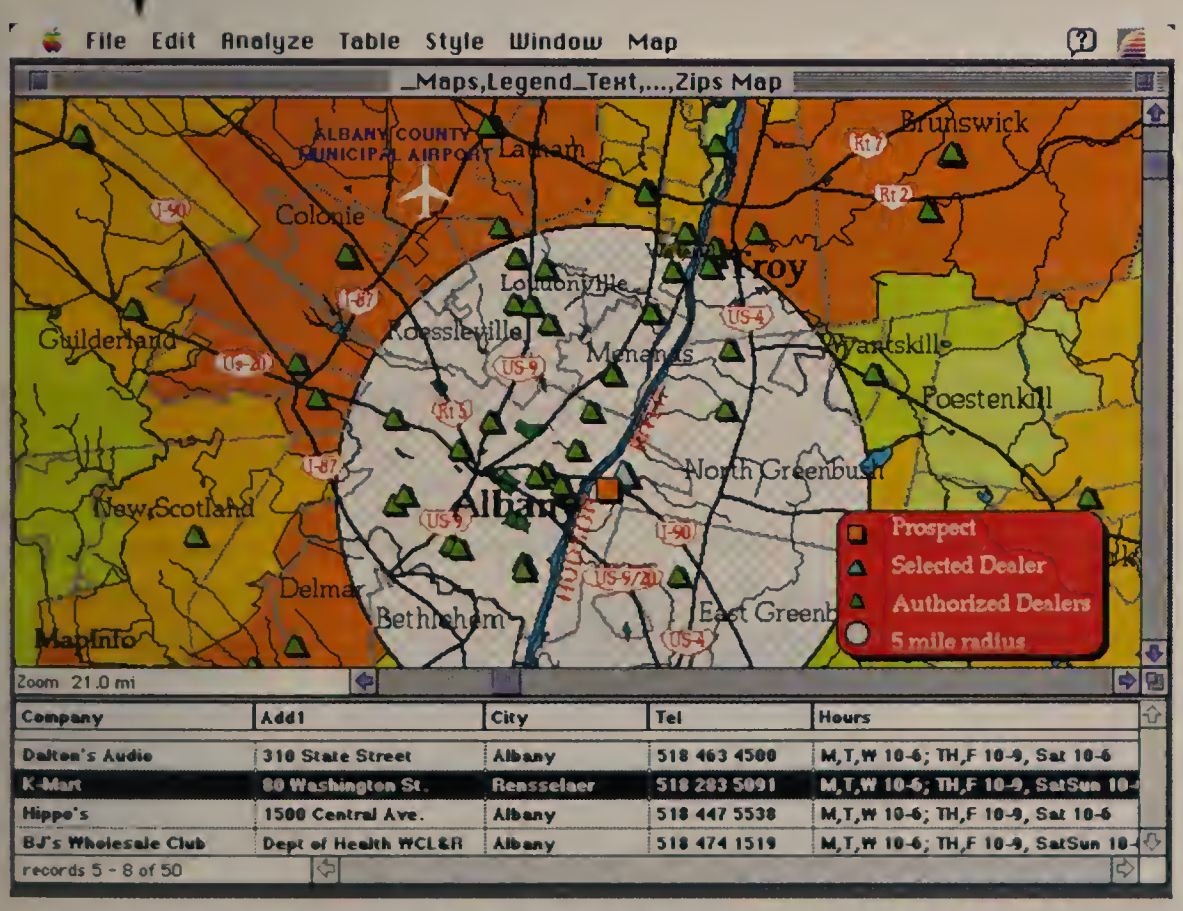

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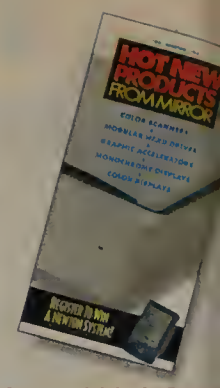

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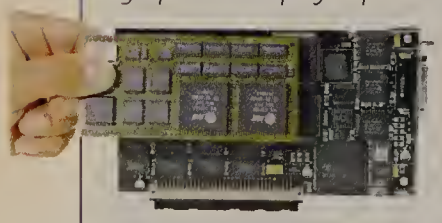

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Full-page Display *July '93*

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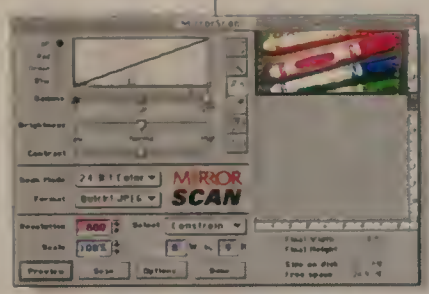
When Macworld's experts tested a field of 14 color scanners, they concluded that you don't have to pay a lot to get a good scanner; you just have to call Mirror.



MirrorScan's powerful features make scanning a snap

The Best Hardware

Mirror's award-winning scanners start with a precision three-pass scanner engine for superb color registration and sharpness. Then we add hardware pre-scan gamma correction for top quality results in much less time. The Mirror Color Scanner is available in 600, 800 and now 1200 dpi models to fit every budget and need.

The Mirror Color Scanners can also scan slides and transparencies. Simply replace the standard cover with the optional Transparency Adapter and you are ready to scan transparencies up to 8.5"x 11.7"

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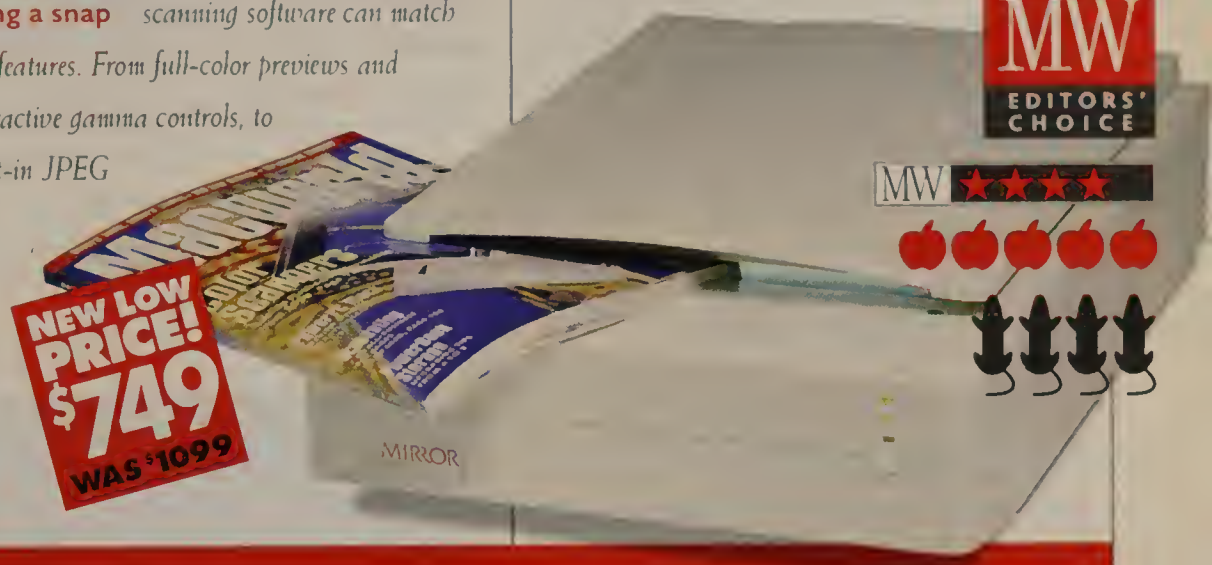
Every Mirror 600, 800 and 1200 scanner includes the Plug-in, application and desk accessory versions of MirrorScan, along with Adobe Photoshop 2.5 and Read-It Pro 3.0 OCR.



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Graphics

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Making Fast Photos without Film

APPLE COMPUTER HAS ANNOUNCED the QuickTake 100, a handheld digital point-and-shoot camera that promises the easy—and fast—capture of 24-bit color still images for use in comps, electronic documents, presentations, and publications.

With its $699 expected street price, the QuickTake 100 (developed with Eastman Kodak) promises higher image quality than similarly priced still-video cameras. The camera offers lower image quality than most digital still cameras but also costs significantly less (most digital cameras cost $5000 and up). The QuickTake is best suited for those who need digital images in a hurry.

The QuickTake 100 uses a charge-coupled device (CCD) array to capture up to 32 low-resolution color pictures (320 by 240 pixels at 80 dpi) or up to 8 high-resolution images (640 by 480 pixels at 180 dpi) at a time. The images are compressed in Apple's new QuickTake file format and stored in the camera's flash EPROM. Once full, the EPROM must be erased before the camera can capture additional images. QuickTake-formatted images can be opened and decompressed using QuickTime. QuickTake software can convert images to TIFF and PICT and is ColorSync-compatible.

Images can be transferred to a Mac using the QuickTake's high-speed serial interface and software. Apple plans to link the QuickTake 100 with the Newton for storing images on Newton PCMCIA cards or transmitting them using the PDA and a modem, but no specifics were available at press time. In addition, Apple's camera includes a plug-in module that lets you transfer QuickTake photos directly into Apple's PhotoFlash image-editing application.

The QuickTake 100 weighs about 1 pound; uses three AA batteries; and has a built-in flash that projects light up to 9 feet, a shutter speed of 1/30 and 1/175, and f-stops between 2.8 and 16. The focal length of the QuickTake 100's lens is equivalent to a 50-millimeter lens on a 35mm camera. Apple Computer, 408/996-1010.—J.A.M.

SCOTT PETERSON

Flying Logos and Textures

TWO NEW PRODUCTS FROM SPECULAR International—TextureScape and LogoMotion—let you design your own textures and animate 3-D logos.

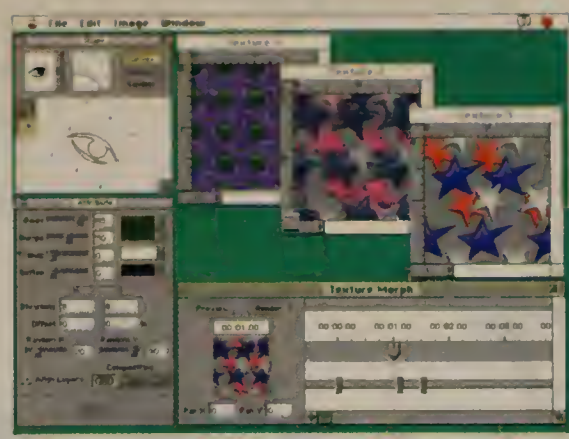
Because it relies on PostScript outlines rather than bitmaps, TextureScape creates textures that are scalable, tilable, and resolution independent. You can generate large, high-resolution textures for use with programs such as Adobe Photoshop, QuarkXPress, and Specular Collage, as well as small, lower-res versions for 3-D texture maps.

The program provides dynamic layering, grid and lighting controls, surface settings, and custom palettes. For each texture you can specify numerous layers—each on its own customizable grid—limited only by memory. Layers can be repositioned at any time, and you can show all layers or just the active one. You can set up to four lights per layer, each with its own Angle, Direction, and Intensity setting. Surface information settings include Gloss, Bump, Transparency, Softness, and Color. You can automatically morph between textures.

LogoMotion, Specular's 3-D logo

animator, includes EPS and DXF support, text beveling, and morphing. LogoMotion lets you place predefined elements—such as animated 3-D objects, lights, and cameras—into a scene that can then be rendered in QuickTime format. LogoMotion ships with a library of elements; additional cameras, lights, props, backdrops, and environments will also be available.

LogoMotion, now shipping, is $149. TextureScape is due at the end of March; pricing had not been set at press time but should be under $250. Specular International, 413/253-3100, 800/433-7732.
—CATHY ABES



Specular International's TextureScape lets you design and animate textures. By placing textures at different points on a time line, you can automatically morph between them.

Closing the Color-Management Loop

MANAGING COLOR THROUGHOUT your Macintosh-based hardware and software should become a little easier, thanks to three new color-management systems recently announced by DayStar Digital, Electronics For Imaging (EFI), and Pantone.

• DayStar Digital's ColorMatch products target entry-level, midrange, and high-end users.

The entry-level $239 ColorMatch bundle includes calibration software, Kodak's Precision Color Management System (KCMS), and Kodak Device Color Profiles. It lets you color-correct, preview, and save color-tagged TIFF files within Adobe Photoshop and QuarkXPress, as well as color-correct Photo CD files. It also offers a CMYK simulation mode.

ColorMatch Colorimeter ($699) includes a 24-bit, 8-bits-per-channel RGB colorimeter, which creates KCMS profiles to calibrate color monitors.

ColorMatch Pro ($2199) provides interactive CMYK simulation within Photoshop for editing images in output-simulation mode; preconfigured color-correction; special effects for image enhancement; and other tools, including Precision Dot Reading and Interchange In/Out RGB filters. DayStar Digital, 404/967-2077, 800/967-2077.

• EfiColor Works is EFI's $399 ColorSync-compatible color-management system for matching colors among scanners, monitors, and printers. Due in early 1994, EfiColor Works includes EfiColor 2.0's color conversion and caching; scanner characterization and calibration; over 100 EfiColor device profiles; a profile editor; EfiColor for Adobe Photoshop; and an EPS XTension that allows QuarkXPress users to manage EPS and DCS files created in Adobe Illustrator, Photoshop, Aldus FreeHand, and EFI's Cachet. EFI, 415/286-8600, 800/285-4565.

• Pantone Open Color Environment (POCE) incorporates Light Source's adaptive calibration for customizing printer profiles, and is based on Light Source's Appearance Equivalence color model. (For more information on POCE, see the item "Pantone Joins the Match Game," *Graphics* news, December 1993.) Pantone, 201/935-5500, 800/222-1149.
—CATHY ABES

DiamondPro 21T Calibrates Color

MITSUBISHI ELECTRONICS RECENTLY introduced the Diamond Pro 21T, a $3199 21-inch color display. Designed specifically for graphics professionals, it includes a Mitsubishi color-calibration system that lets you store three separate sets of on-screen colors to match output, Pantone, or other color samples.

According to Mitsubishi, the 21T's proprietary monitor technology offers exceptional focus and pixel accuracy, even in the corners of the display. The 21T also enables users to adjust the monitor's white-point balance (important for prepress work), image rotation, linearity, and other characteristics using front-panel buttons or software controls.

MARK JOHANN

The 21T supports a maximum resolution of 1600 by 1200 pixels (noninterlaced) at a 66Hz refresh rate; the maximum 24-bit color display size, however, is 1360 by 1024 when used with SuperMac's Thunder II graphics board (the 21T is compatible with most third-party graphics boards). In addition, the 21T offers a 0.31mm aperture grill pitch and an antiglare coating; the monitor meets both the Energy Star standards and MPR II guidelines. Mitsubishi, 714/220-2500, 800/828-6372.—JAM

IN BRIEF

■ **SummaSketch Tablets** SummaGraphics Corporation's SummaSketch FX digitizing tablets use a pressure-sensitive stylus with 256 pressure levels. The SummaSketch FX Pro is the first stylus to have a spring-loaded cartridge, which makes for smoother transitions in pressure as a user moves the stylus across the tablet. The pen can be switched from corded to cordless and from battery to AC power. SummaGraphics offers a 12-by-12-inch tablet ($649) and an 18-by-12-inch version ($1149). 203/881-5400.

■ **Desktop Color Made Clear** ColorExpert is a $395 CD-ROM reference guide/tutorial/troubleshooter devoted to the subject of color. The disc includes chapters on scanning, imagesetting, and printing, as well as test files. ColorExpert, 416/360-3894.

■ **GCC Printer Goes High Resolution** GCC Technologies, primarily known for its low-end printers, is introducing its first high-resolution printer, the SelectPress 1200 ($7499), a 1200-dpi plain-paper typesetter that can handle 12-by-19-inch tabloid-size pages and full-bleed spreads. The PostScript Level 2 printer includes a SCSI port, multiple sheet-feeders, 24MB of RAM (expandable to 40MB), a 160MB hard drive for downloaded fonts, and multiple active ports (serial, parallel, LocalTalk, and Ethernet). 617/275-5800, 800/422-7777 in the United States, 800/263-1405 in Canada.

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Expert Graphics

GRAPHICS PROFESSIONALS SHARE THEIR SECRETS

by Cathy Abes

Artist: Diane Fenster is an illustrator and artist based in Pacifica, California, whose clients include *Macworld*, *Print*, *How*, *Publish*, and *Mac Art and Design*. Her illustrations have appeared in several books about Photoshop, and her digital art has been internationally exhibited.

How It Was Done: For the illustration that opens this month's feature on DSP boards, Fenster interspersed photos of the boards with some vintage clip art images. Fenster selected a section of the textured background, copying and pasting it to a new file so she could integrate it with the scanned image of the man. After combining the man and the background using the Composite Controls command and the Multiply mode (which mixed the color values of the two images), Fenster copied and pasted the image of the man and background into the main illustration. Then she used Adjust Hue/Saturation to heighten the contrast between the figure (the floating selection) and the background. Once she had saved the image into the illustration, Fenster feathered the selection. Then she cut and pasted it, and moved it slightly to the right. After increasing the color saturation, she repeated the feather/cut-and-paste/offset process with the second image.

Next she focused on the scanned photos of the three DSP boards, photographed by Jim Sugar. For each board, Fenster left one scan in its original form and manipulated the other. First she colorized one of the boards and applied the Solarize filter. Then she altered and intensified the colors using Hue/Saturation and Color Balance. After applying motion blur to a duplicate of the image, she reduced the duplicate slightly, then copied and pasted it onto the solarized version. She scaled the floating selection slightly larger than, and offset from, the original. After setting the Composite Controls' Darken mode to 60 percent, she increased the saturation to 20 percent, then deselected the image. Finally, she deepened edges and highlights with the dodge/burn tool. m

1 The original clip art image of the man, scanned at 300 dpi and resampled to 254 dpi.

2 Fenster pasted the man over the textured background and saved the selection. With the selection still active, she chose Composite Controls (Edit menu) and the Multiply mode to make the textures show through the white areas.

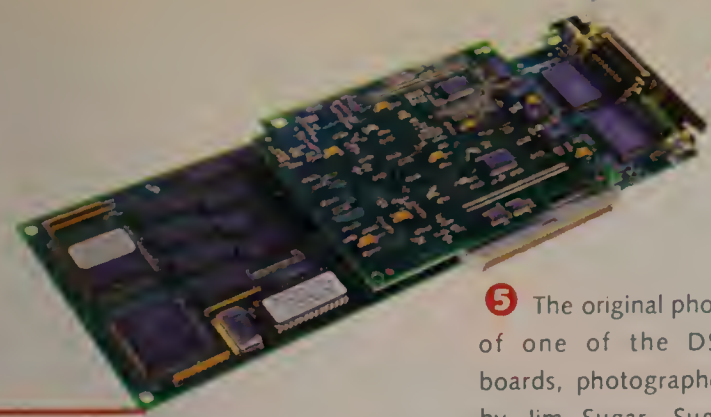
3 Once the image had been positioned, colorized, and saved as part of the illustration, Fenster applied a feather with a 15-pixel radius and cut the selection, which gave it a bleached-out effect.

4 She then pasted it, which made it less saturated and more transparent than the original, and offset it slightly from the original.

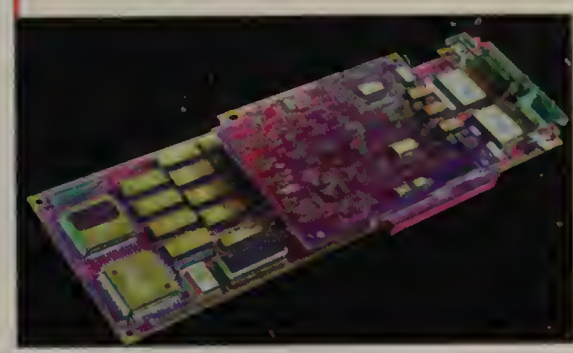
THE TOOLS

Hardware: Mac IIfx with 32MB of RAM and a 425MB Quantum internal hard drive; 337MB Wren Runner external hard drive; Sony 128MB optical drive; 44MB SyQuest removable-cartridge drive; Nexus FX 55MHz accelerator board; AppleColor 13-inch monitor; 19-inch MegaGraphics monochrome monitor; AppleScanner with Abaton gray-scale upgrade.

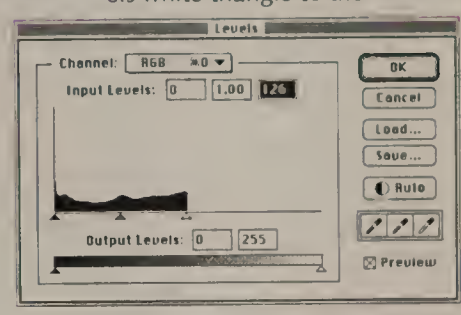
Software: Adobe Photoshop 2.5.1.



5 The original photo of one of the DSP boards, photographed by Jim Sugar. Sugar used strobe lights above and below the board together with a gold reflector (which bounced light onto the board to give it a golden cast); he scanned the photo at high resolution with a Leaf scanner.

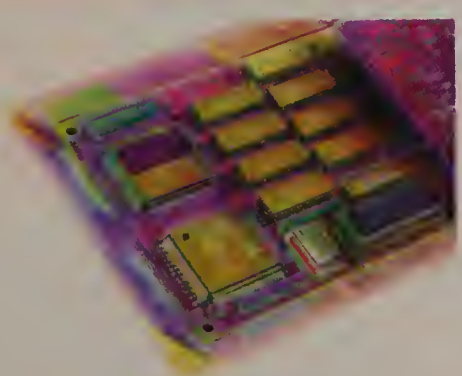


6 Fenster first colorized the board and applied the Solarize filter (Filter > Stylize). Then she chose the Levels command (Image > Adjust) to display a histogram of the image. By sliding the Output Levels white triangle to the



histogram's rightmost peak (bottom), she lightened the image. Then she used Hue/Saturation and Color Balance to alter and intensify the colors (top).

7 After creating a duplicate of the image using the Duplicate command (Image > Calculate), Fenster selected the Motion Blur filter (Filter > Blur). She set it to 45 pixels at a –37° angle and applied it to the duplicate.



8 Fenster used the burn option of the dodge/burn tool (which she set to 21 percent exposure for midtones in the brush palette) to darken and brighten the board's edges and the motion highlights in various parts of the board.

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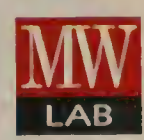
Photoshop Accelerators

BY CHARLES SEITER



MACWORLD LAB TESTS DSP BOARDS THAT PUT PHOTOSHOP FILTERS ON FAST-FORWARD

If you frequently need to retouch large image files in Adobe Photoshop using such filters as Gaussian Blur, Sharpen, and Emboss, then you need either the patience of Mother Teresa or a digital signal processor (DSP) board.

Applying a Photoshop filter to an image that is a couple of megabytes or more in size quickly becomes an exercise in endurance, as the process typically involves large mathematical computations; even a Quadra 800 seems pretty poky when sharpening a 40MB TIFF file. To the rescue come DSP boards—special-purpose hardware with microprocessors designed specifically to accelerate the math operations that lie at the heart of most Photoshop filters (some boards can also accelerate filters in other programs, such as Fractal Design's Painter).

DSP technology received a lot of attention with the release last year of Apple's AV Macs, which include AT&T's DSP3210 chip as a dedicated processor for telephony and video processing, among other tasks. If you already own a Quadra 660AV or 840AV, you can use the AV Macs' DSP to accelerate Photoshop filter operations using Adobe Systems' AV DSP Power Plug-In for Photoshop. The plug-in sends 18 filter operations to the 3210 DSP, is included in Adobe Photoshop 2.5.1, and is available free from online services such as America Online and CompuServe, or for a $10 shipping-and-handling fee from Adobe Systems (415/961-4400).

After a year or two of false starts, DSP boards began appearing on store shelves in late 1993. Among companies now selling or planning to sell DSP products are Radius, SuperMac, DayStar Digital, E-Machines, and RasterOps, at prices ranging from just under $500 up to nearly $5000. As we went to press, the DSP-board market was evolving rapidly—during the time we spent researching, testing, and writing this article, some products were discontinued, new ones were introduced, and some product prices and specs changed. As a result, this article is a snapshot of the changing DSP market circa December 1993. By the time you read this, it's extremely likely that some prices will have dropped noticeably and that clock speeds for some DSP boards will have increased—so ask questions before you buy.

The five DSP boards Macworld Lab evaluated are reviewed in this article in order of speed, from the product we found to be the overall fastest (the Radius PhotoBooster) to the overall slowest (DayStar Digital's Charger Plus). From our tests we found that, in general, the

MW LAB Which DSP Boards Are the Fastest?

All times are in seconds.

Relative Speed
- 100% (Fastest)
- 90%–99%
- 80%–89%
- 70%–79%
- 0%–69%

	Overall Fastest	Resize[1]	Rotate[2]	Skew	Perspective	Blur	Blur More	Gaussian Blur[3]
1.00	Radius PhotoBooster	13.7	45.7	56.8	29.1	6.6	7.5	34.9
0.94	SuperMac Thunder II GX•1360	16.0	43.3	49.3	28.1	10.6	10.4	28.9
0.86	SuperMac ThunderStorm For Adobe Photoshop	18.5	50.1	52.4	31.6	10.7	10.9	29.9
0.78	DayStar Digital Image 040	21.6	55.9	51.7	42.2	11.5	12.3	37.2
0.77	DayStar Digital Charger Plus	22.0	55.5	55.3	52.1	11.1	11.8	36.4
0.43	Standard Macintosh Centris 650	51.2	96.7	70.7	57.2	11.7	18.9	134.8

Macworld Lab tested DSP accelerator performance on 14 standard Photoshop filters. We also tested 3 filters (RGB to CMYK Conversion, Emboss, and Scale) accelerated by most, but not all, of the DSP boards tested. We also tested an unaccelerated Mac for comparison. Some accelerators show no speed improvement on selected filters —this means the vendor hasn't implemented the software to route those filter functions to the board's DSP chips. We ran tests on a typical, not an ideal, Mac: a Centris 650 with System 7.1, Hardware System Update 2.0, 32-bit addressing turned on, and 24-bit color on a 16-inch color monitor (using RasterOps 24STV). Filter performance on 10MB files was benchmarked using a 37MB memory partition for Photoshop, and a 1.3GB boot disk as the primary scratch disk.

boards were often twice as fast at running our core set of 14 Photoshop filters as a Centris 650 without DSP acceleration—and sometimes nearly four times as fast. (For complete test results, see "Which DSP Boards Are the Fastest?")

How DSPs Work

Photoshop filter acceleration is a highly specific function that's usually more math-intensive than QuickDraw calls are (for Macworld Lab test results of 24-bit QuickDraw accelerator cards, see the feature "Fast Track to 24-Bit Color," in this issue). Photoshop filter accelerators depend on software that traps filter calls to the CPU and passes them to DSP chips. Basically, the DSPs are a type of specialized math coprocessor designed to perform multiplications rapidly in parallel (most products use two DSP chips and split up computations between them).

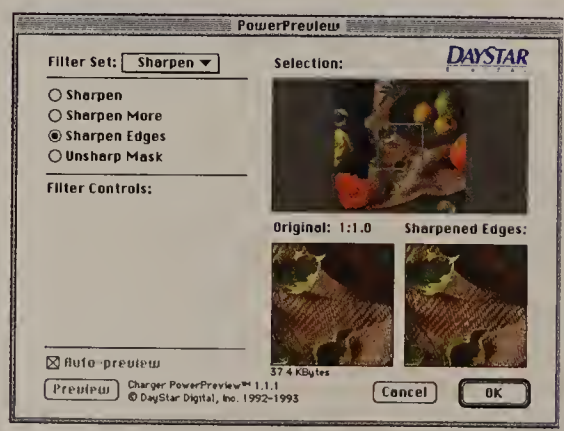
Many filters accomplish their tasks by taking sums and differences of transformed versions of the original image. The exact number of computations needed to alter an image using a filter depends on the size of the image. A filter applied to a 5MB image, for instance, can result in more than 100 million arithmetic operations, a large fraction of which will be multiplications.

A computer image is, in essence, a configuration of numbers, coded in colors by the Mac so it's easier to manipulate. Applying a Photoshop filter to that 5MB image is the equivalent of recalculating a ridiculously large spreadsheet (an 8½-by-11-inch image at 300 dpi is a 2550 by 3300 array of numbers) in which the recalc operates on every cell. That's why Photoshop filters in native mode on a Mac without a DSP board are so slow.

What about PowerPC?

As the first PowerPC Macs are expected to ship this spring, many Photoshop users may wonder whether DSP boards are still a worthwhile investment. Some vendors have wondered the same thing—Newer Technology, for example, had developed a Photoshop accelerator board for the Mac but scrapped its plans to market the board, believing DSP products would have a short life in the face of PowerPC.

While the first PowerPC Macs to appear will have standard PDS and/or NuBus slots, the next generation is expected to use a new bus format, the PCI—meaning the DSP boards you buy today aren't designed to work in the PowerPC models to be released a year or two from now. Even if that becomes the case, however, DSP boards in PowerPC Macs will be largely superfluous; Apple claims that the PowerPC Macs' multitasking RISC processor will be all you need for image-editing acceleration.



A Preview of PowerPreview Even with acceleration, complex filter operations on large files are frightfully languid. DayStar's PowerPreview plug-in lets you inspect filter effects instantly on small patches of an image, so you can decide if your results will be worth the wait.

Nonetheless, DSP boards should remain a cost-effective upgrade to existing Macs for at least the next year or two. The first 60MHz PowerPC Macs should have about three to five times the processing power of the Quadra 800 (with its 33MHz 68040 microprocessor), according to Apple estimates. But if most of your computing time is spent using Photoshop, you can get an equivalent speed increase for much less than the price of a new PowerPC Mac. For example, a PowerPC Mac with the 60MHz 601 chip (complete with monitor and keyboard) should cost about $2000 and up. By comparison, the overall fastest DSP board we tested, the Radius PhotoBooster, costs $999.

PhotoBooster

Radius's PhotoBooster ($999) has a lot going for it. The software is unobtrusive—you use the same menu commands as in Photoshop to run the filters. Besides accelerating the common filters in our test suite, the PhotoBooster accelerates conversion of RGB files to CMYK format. Overall, the PhotoBooster was the fastest board we tested; pop it into a Quadra 800 and critical Photoshop operations speed up by a factor of two to three—even though the Quadra is pretty speedy (approximately four times as fast as a Mac IIci) on its own. In our sharpening, blurring, and resizing tests, the PhotoBooster was significantly faster than its competitors; the board was nearly twice as fast as the DayStar Charger Plus, for example, when applying the sharpen filter to our 10MB test image. These are important speed advantages, as Sharpen and Blur are among the most-often-used Photoshop filters.

Since the PhotoBooster board uses

Motion Blur[4]	Despeckle	Sharpen	Sharpen More	Unsharp Mask[5]	Find Edges	High Pass[6]	Features Not Accelerated by All Boards: RGB to CMYK	Emboss[7]	Scale
125.5	23.7	6.2	7.5	49.6	19.7	40.1	69.6	8.8	29.2
[illegible]	[illegible]	10.2	10.9	44.4	17.2	35.2	101.0	14.2	53.1
40.1	23.7	10.8	11.7	45.2	20.7	35.6	101.0	16.0	53.1
163.5	[illegible]	11.9	12.8	42.2	17.0	41.3	101.0	44.2	27.6
170.5	[illegible]	11.4	12.1	44.8	16.6	42.3	101.0	44.2	28.6
201.0	71.0	15.0	19.2	149.0	48.9	141.0	101.0	44.2	53.1

[1] *Test image was resized by 78 percent.*
[2] *Rotation was 13 degrees in circumference, clockwise.*
[3] *Gaussian Blur filter was set at a radius of 5.0 pixels.*
[4] *Motion Blur filter settings were a 46-degree angle and a distance of 10 pixels.*
[5] *Unsharp Mask settings were Amount, 50 percent; Radius, 5.0 pixels; Threshold, 0 levels.*
[6] *The High Pass filter was set with a radius of 5.0 pixels.*
[7] *Emboss settings were angle, 135 degrees; height, 3 pixels; amount, 100 percent.*

the same 3210 DSPs as Apple's AV Macs, the PhotoBooster can also support Apple Real-Time Architecture (ARTA). That won't do anything for you in Photoshop, but ARTA support means that the same accelerator board can run speech, audio, and video processing at high speeds.

By using the PhotoBooster in your only Quadra PDS slot, however, you plug your upgrade path to PowerPC, since Apple plans to use this slot for 68040-to-PowerPC upgrades. This may not matter —if you're a devoted Photoshop user the PhotoBooster should get you nearly as much speed as a PowerPC Mac for this application, anyway—but it may be a consideration a few years down the road.

(At press time, Radius had just released a software upgrade to PhotoBooster that will reportedly increase many filter-operation speeds by as much as 20 percent. The upgrade is available from online services free of charge.)

Thunder II GX•1360

Overall, SuperMac's NuBus board was slightly slower than the Radius PhotoBooster (its overall speed index was 0.94, compared with PhotoBooster's 1.00 index). The Thunder II GX•1360 was noticeably slower than the PhotoBooster in our sharpen and blur tests. But the Thunder II GX•1360 was significantly faster than the PhotoBooster for Motion Blur and 20 percent faster on an assortment of other tests, including Gaussian Blur and Despeckle. (A spokesperson for SuperMac said that a software upgrade for its Thunder DSP boards will boost filter speeds in some cases by as much as 20 percent; by the time you read this, the upgrade should be available at no charge from online services.)

One difference between the Radius and SuperMac boards that you're sure to sit up and notice, however, is the price—the Thunder II GX•1360 weighs in at a hefty $4499 (with an estimated street price closer to $3500). Unlike the PhotoBooster, SuperMac's board is a complete graphics subsystem—it includes 24-bit color support, acceleration of all QuickDraw graphics functions (not just Photoshop), and a DSP daughterboard. In addition, the Thunder II GX•1360 supports, as its name implies, 1360-by-1024-pixel display on a 21-inch monitor (such as Radius's $3999 PressView 21-inch display)—meaning that this board has, among other things, about $1500 more video memory than its competitors. If you need a large viewing area for your graphics work, the Thunder II GX•1360 is a good choice, as it keeps scrolling to a minimum.

A distinct difference between the SuperMac boards and the DSP products we tested from other vendors is that SuperMac's filters are in a separate SuperMac submenu under Photoshop's Filters menu rather than in the standard Photoshop menu. Also, the Thunder II GX•1360 accelerates direct manipulation of images in CMYK mode, rather than accelerating of file conversion between CMYK and RGB.

Since its performance doesn't trail the PhotoBooster by much, the bottom-line question of whether to buy the Thunder II GX•1360 is this: Should you sink nearly $5000 into a Mac you already own when PowerPC Macs promising similar or greater filter performance increases will be available this spring for $2000 and up? You'll probably find that a PowerPC,

continues

BEHIND OUR TESTS

MW LAB Macworld Lab tested a total of 17 filters and features of Photoshop 2.5.1 that typically cause performance bottlenecks. We had two goals—to see how much faster we could perform these functions, and to find out if applying Photoshop filters developed by companies outside of Adobe would render results that were noticeably different from what you'd get using Adobe-developed Photoshop filters (DSP board manufacturers develop and optimize Photoshop filters to run with their hardware).

Macworld Lab tested all the Photoshop accelerators on a Macintosh Centris 650 with 40MB of RAM, an external 1.2GB Micropolis hard drive, System 7.1 with Hardware System Update 2.0, and the Apple 16-inch color monitor in 24-bit mode driven by a RasterOps 24STV graphics board. For comparative purposes we ran the Photoshop filters on an unaccelerated Centris 650 to get baseline timings, then we retested with a Photoshop accelerator installed. All tests were performed with AppleTalk off, 32-bit addressing on, virtual memory off, and the disk cache set to 32K.

We chose an RGB image with a wide range of colors and shadows for our tests. When working in Photoshop, you need a memory space that's roughly four times the size of your file (a 5MB file needs a minimum Photoshop memory partition of 20MB). For insurance, we increased the memory partition of Photoshop to the maximum available to us—37MB.

To check for filter consistency, we used Photoshop to compare the original image after Adobe's filters were applied to another version of the same image with third-party filter effects applied. We generated a histogram on the image manipulated using third-party filters and discovered that in a few cases there were variances in color levels and noise of less than 10 percent; otherwise, there were no differences in image quality as a result of using third-party filters.—**Macworld Lab testing supervised by Danny Lee**

Making the Most of Photoshop Filters

BY DEKE McCLELLAND

Almost any Macintosh artist will agree that Adobe Photoshop is one of the most full-featured, powerful graphics tools around. Though I've spent countless hours with Photoshop and hundreds of pages documenting its capabilities, I'm continually discovering some exciting new trick or technique.

So it's not surprising that this issue of *Macworld* devotes so much space to Photoshop-related issues. In addition to covering a range of DSP boards that speed up select Photoshop functions and several 24-bit graphics cards that accelerate the scroll speed of Photoshop and other programs (see "Fast Track to 24-Bit Color," in this issue), we've assembled some useful techniques to help you get even more out of this powerful program. And because each relies on Photoshop's native filters—no add-ons required—all you need is in Photoshop 2.5 or later. Of course, you'll need at least a working knowledge of Photoshop to make the most of these tips.

Cleaning Up a Scanned Halftone

Public-domain images printed in old books and magazines can be wonderful scanning resources. Of course, it's up to you to make sure that the image you scan is no longer protected by copyright (most, but not all, works over 75 years old are considered fair game), or that your noncommercial application of the image falls under the fair-use umbrella of commentary or criticism.

But copyright isn't the only consideration. When you scan a printed image, you're actually scanning very small halftone dots rather than a continuous-tone photograph. In most cases, the pattern of the halftone dots clashes with the resolution of the scanner to produce rhythmic and distracting moiré patterns. Getting rid of these moirés is a problem that eventually haunts nearly every Photoshop user.

While there is no infallible method for eliminating moiré patterns, you can smooth out most images and still retain important detail by applying the Gaussian Blur, Median, and Unsharp Mask filters to individual color channels.

As an example, I've scanned an image from a previous issue of *Macworld* and blown up a detail of it, so you can better see the moiré pattern. (Since I created the original image, *Macworld* won't sue me, but you shouldn't try it.)

Like most color scans, this is an RGB image. Photoshop allows you to examine the red, green, and blue color channels independently by pressing ⌘-1, ⌘-2, and ⌘-3, respectively. In viewing the channels, you are likely to find that each one is affected by the moiré pattern to a different extent. In the case of this scan, all three channels needed work, but the blue channel was the worst. The trick, therefore, was to eliminate the patterns in the worst channel and draw detail from the other two.

To fix the blue channel (⌘-3), I applied both the Gaussian Blur and Median commands in fairly hefty doses. First I chose Filter > Blur > Gaussian Blur and specified a radius value of 1.5 pixels, rather high considering the image measures only about 300 pixels tall. Then I chose Filter > Noise > Median and specified a radius of 2. (Unlike Gaussian Blur, Median doesn't accept decimal values.) The result was a thickly modeled image with no moirés but little detail. To harden the edges, I chose Filter > Sharpen > Unsharp Mask and entered 200 percent for the Amount option and 1.5 for the radius. I chose this radius value because it matched the radius I used to blur the image. (For correcting moirés, a threshold value of 0 is almost always the best choice. A higher threshold value would not only prevent the sharpening of moiré pattern edges but would also ignore real edges, which are already faint enough as it is.)

Of the two remaining channels, the green one required more attention than the red. After switching to the green channel (⌘-2), I applied the Gaussian Blur filter with a radius of 1. Then I sharpened the image with the Unsharp Mask filter set to 200 percent and a radius value of 1 (again, matching the blur radius). In the red channel (⌘-1), I applied Gaussian Blur with a radius

An image scanned from an old issue of *Macworld* as it appears in RGB mode (top right), and with each channel shown separately (top left). The image (bottom right) and its channels (bottom left) after I suppressed the moirés with the Gaussian Blur, Median, and Unsharp Mask filters.

Here are the results of applying two different filters, Unsharp Mask (left column) and Emboss (right column), to images surrounded by borders. In each case, only the area inside the border was selected; the border itself was not. Only the bottom images were floated, which prevented the borders from affecting the performance of the filters.

value of 0.5. The gradual effect wasn't enough to warrant sharpening.

When you try this with your own images, you should now switch back to the RGB view (⌘-0) to see the combined result of your labors. The focus of the image will undoubtedly be softer. You can cure this to a limited extent by applying very discreet passes of the Unsharp Mask filter, say, with an amount value of 100 percent and a low radius value. Keep in mind that oversharpening may bring the patterns back to life or even uncover new ones.

Finally, the most important thing to remember is always to scan halftoned images at the highest resolution available to your scanner. Then resample the scan down to the desired resolution using the Image > Image Size command. This step alone goes a long way toward eliminating moirés.

Float, Then Filter

Every student of filters should know a simple rule: Always float your selection before applying a filter to it. You accomplish this by selecting the area of the image you want to filter and choosing Select > Float (⌘-J). One reason for first floating your selection is that many filters take neighboring pixels into consideration even if those pixels are not selected. When a selection floats, it has no neighboring pixels; therefore, the filter affects only the selected pixels.

Multiplying and Screening Filters

Another reason for floating a selection before filtering it is that floating permits you to mix the filtered selection (the floating copy) with the underlying original by using either the pop-up menu options in the Brushes palette or the Composite Controls command (under the Edit menu). The most flexible composite modes are Multiply and Screen, which darken and lighten pixels, respectively, by mixing colors in the floating image with those in the original. While Multiply and Screen are available from the Brushes palette and the Calculate submenu (under the Image menu), the two modes take on added capabilities when selected from the Composite Controls dialog box. Here, not only can you mix colors, but you can also specify—by dragging and option-dragging the triangles below the Floating slider bar—which colors are affected. For example, here's how you would heighten the contrast of a selected area.

1. Float the selection (⌘-J) and apply the desired filter.

2. Copy the filtered image (⌘-C). You'll need this image again in a moment.

3. Choose Edit > Composite Controls to display the Composite Controls dialog box. Select Multiply from the Mode pop-up menu to darken the original image with the filtered (floating) one.

4. To retain only the darkest portions of the floating image, drag the triangle on the right-hand side of the Floating slider bar to about 140. This chops off the lightest colors in the selection (0—the location of the left-hand triangle—is black, and 255 is white). To gradate the dark pixels from opaque to transparent, option-drag the left half of the right-hand triangle—the option key allows the two halves to split—to about 70. Now pixels in the floating image that have a brightness value of 70 or less are opaque, and those of 140 or higher are transparent. Press the return key to apply your changes.

5. Press ⌘-option-V to both paste the image you copied to the Clipboard and bring up the Composite Controls dialog box. (Incidentally, pasted images automatically float until they're deselected.) This time, select Screen from the Mode pop-up menu to lighten the selected area.

6. To dump the dark parts of the pasted image, drag the triangle on the left side of the Floating slider bar right, to about 120. Then option-drag the right half of that triangle to 190 or so. The Screen effect fades across the lightest colors in the selection. Press the return key to apply your changes.

Depth of Focus

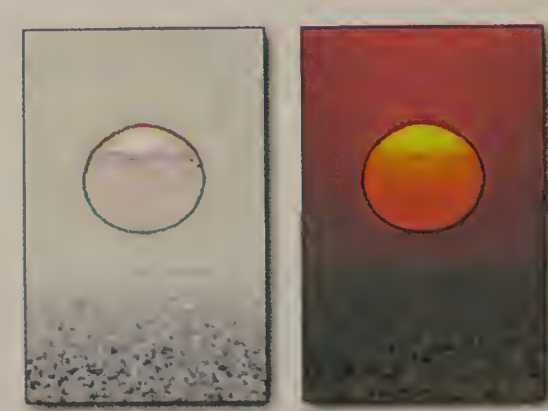
Except for portraits and other close-ups, most photos are shot several feet from the nearest subject, allowing the photographer to keep all details—regardless of their relative distance—in perfect focus. But this isn't

continues

ORIGINAL (NO FILTER)

UNSHARP MASK

EMBOSS



FIND EDGES

Here are the results of using the Multiply and Screen modes to mix colors in floating images with an underlying original. In the left column are the floating images, each with a different filter applied, the right column shows each filtered image multiplied and screened over the original image.

Making the Most of Photoshop Filters (continued)

In the original photo (left), all parts of the bridge appear evenly focused. To gradually blur the bridge's forward deck, I masked out the rest of the photo in Quick Mask mode and drew a gradation across the deck (middle). I then exited Quick Mask mode and blurred the selection (right).

necessarily how you see things in real life. An object 3 yards away appears in focus while an object 3 yards behind it does not.

1. You can isolate and blur portions of a photo to heighten the appearance of depth. For example, suppose you want to make the Golden Gate Bridge appear to extend beyond your field of vision by progressively blurring it as it comes toward you.

2. First select the forward portion of the bridge with the lasso or pen tool. Then click on the Quick Mask icon in the toolbox to enter the Quick Mask mode. Assuming default settings, the areas outside the selection appear colored (in this case, a bright blue-green) to show they are masked. The selection appears unchanged.

3. Select the gradient tool and select Darken from the pop-up menu in the Brushes palette. This ensures that the gradient tool adds only to the mask, thus feathering the current selection. Drag with the tool inside the selection. Begin dragging from where you want to blur the least and toward the area you want to blur the most (from the base of the bridge toward the left side, which is nearest the viewer).

4. Return to the normal editing mode by clicking on the icon to the left of the Quick Mask icon in the toolbox. Then apply one of the blur filters. In the example above, I applied the Motion Blur filter to match the angle of the bridge with a distance value of 10 pixels. Alternatively, you might use the Radial Blur filter set to Zoom. I also changed the color of the selection slightly using Image > Adjust > Hue/Saturation (⌘-U). I repeated this technique several more times to blur the right half of the bridge as it fades into the horizon and both blur and colorize the water. To create the black border I used a simple feathered selection.

Thick 'n' Chunky Text

Photoshop's Noise filter invariably produces a single-pixel spray. But you can "chunk up" the noise by applying one of several other filters, including Median, Crystallize, Mosaic, and Facet. In the following steps, you'll take a standard block of text and make it look like it was carved out of some kind of molding gelatin with chunks of goop flaking off it. Finally, there's a technique you can sink your teeth into!

After filling some text with a gradation and applying the Add Noise filter (top), I thickened the noise using the Median filter (middle). Finally, I floated the selection, applied the Facet and Trace Contour filters, and selected the Darken option to create a crackle effect (bottom).

1. After creating some large text, set the foreground and background colors (red and green below), and drag over the text with the gradient tool. (Set the pop-up menu in the Brushes palette to Normal.)

2. Choose the Filter > Noise > Add Noise command. Specify a very high amount value, such as 100, and select the Gaussian Distribution option. Press the return key to create the noise.

3. Choose Filter > Noise > Median, enter a radius of 2 pixels, then press return. Photoshop blurs the noise into a mottled, tartanlike affair.

4. Select the text with the rectangular selection tool. Then float the selection (⌘-J) and choose Filter > Stylize > Facet. This paving-stone pattern will serve as the basis for the outlines around the chunks.

5. Choose Filter > Stylize > Trace Contour to trace around the edges of the faceted pattern. You can experiment with the level value to achieve different effects, but the default value will do.

6. To make all the outlines black, choose the Image > Map > Threshold command (⌘-T). Enter a threshold-level value of 255—the highest possible value—and press the return key.

7. Now select Darken from the pop-up menu in the Brushes palette. The white areas disappear; the black lines trace the contours of the gradient text.

8. Here's how you can give the text a slightly three-dimensional quality. First you select it again with the rectangular selection tool and ⌘-click with the magic wand to deselect the white background (making sure the Anti-aliased option is unchecked in the Magic Wand Options dialog box). Next, you press the option key and the left-arrow key to create a clone slightly to the left of the original text, and then press the option and up-arrow keys to create another clone slightly above the first clone.

DEKE McCLELLAND is a *Macworld* contributing editor and author who has written extensively about Macintosh graphics, including the *Macworld Photoshop 2.5 Bible* (IDG Books Worldwide, 1993).

My thanks to PhotoDisc for the original photographs used throughout these figures and to Seattle-based artist Mark Collen for pointing me down the filter path.

with a much faster bus and hard drive than today's Macs have, is a better investment than the Thunder II GX•1360.

ThunderStorm For Adobe Photoshop

SuperMac's ThunderStorm For Adobe Photoshop ($499) is a NuBus DSP accelerator that works with other 24-bit graphics boards and was the least expensive DSP board we tested.

The Thunder II GX•1360 uses an 80MHz DSP16A, while the ThunderStorm For Adobe Photoshop has a 64MHz DSP16A. You might assume, then, that there would be a consistent 20 percent speed difference in favor of the Thunder II GX•1360, on the grounds of chip clock speed. But in our testing, we found differences approaching 20 percent on smaller (5MB) files, with this relative difference diminishing to 12 percent on larger (10MB) files. This suggests that the slow operation of Photoshop's virtual memory keeps the 80MHz 16A in the Thunder II GX•1360 from going full tilt running filters on larger files.

In terms of overall performance, ThunderStorm For Adobe Photoshop wasn't too far behind the Thunder II GX•1360. When applying Skew, Unsharp Mask, and High Pass filters, ThunderStorm For Adobe Photoshop was slightly faster than the PhotoBooster; with Motion Blur, ThunderStorm beat the pants off PhotoBooster.

Image 040

DayStar Digital is working hard to establish itself as a leader in graphics acceleration. Its new Photoshop Automation Technology, which batch-processes a number of routine Photoshop tasks through software, is a good example (for more information, see *Graphics* news, *Macworld*, February 1994). DayStar is also among the first vendors to introduce a PowerPC coprocessor board for 68040 Macs (pricing wasn't set at press time; for more information, see *News*, *Macworld*, December 1993).

The Image 040 ($2199) consists of DayStar's general-purpose Quad 040 accelerator (including a 40MHz 68040 processor, the same CPU as the Quadra 840 AV) with a 128K memory cache and DayStar's Charger twin-16A DSP daughterboard. In addition, the Image 040 (along with the Charger Plus; more on that board later) offers an attractive software bundle that includes PowerPreview (see the table, "DSP Boards in Detail," for more information). Developed by DayStar, PowerPreview is a highly useful utility that enables you to immediately preview the effects of applying a particular filter (see the screen shot "A Preview of PowerPreview"). In addition, DayStar claims that the AutoCache feature in the Image 040's installation software dodges some of the incompatibility problems that keep older applications from running on 040 systems.

The Image 040 is a PDS board, and with DayStar's $119 SlotSaver adapter you can leave the only PDS slot on your Quadra or Centris open for possible PowerPC upgrades later. PhotoBooster, in contrast, doesn't offer that option.

From our tests, we found that the Image 040 was actually fastest at Unsharp Mask, a highly math-intensive task, and at Scale. The board came in second on Skew and Find Edges; its overall speed is about 80 percent as fast as PhotoBooster, and it's only marginally behind the SuperMac boards. With the Image 040 you get a faster machine and DSP, but for the same amount of money you'll be able to buy a PowerPC Mac, so this board isn't as attractive as it was in 1993.

At press time, DayStar announced plans to release the Image 060, based on the 68060 chip. A spokesperson said the board should offer speeds approaching PowerPC 601 levels. Pricing wasn't final but was expected to be about $2400.

Charger Plus

DayStar's Charger Plus ($749) uses the same dual AT&T DSP16A chip set as the Image 040, incorporated onto a NuBus board. There's no CPU acceleration, though, which is the main difference between the Image 040 and the Charger Plus. DayStar also offers the same DSP board with Photoshop filters only, called the Charger ($579).

The software included with the Charger Plus is called Charger Suites Vol. 1. The other Charger Suites (volumes 2 to 5) include support for the Kodak DCS 200 digital camera, the Kodak Color Management System (KCMS), and acceleration of color transformation and acquisition of Photo CD images. (Volumes 2 to 5 are optional purchases; prices range from $199 to $579 per volume.)

In terms of performance, results for the Charger Plus were nearly identical to those for the Image 040, although the Charger Plus was the fastest DSP board overall at applying one filter—Find Edges. With its $749 price tag, the Charger Plus is more expensive than SuperMac's ThunderStorm board, but

DSP Boards in Detail

	DayStar Digital	DayStar Digital	Radius	SuperMac	SuperMac
Product	Charger Plus	Image 040	Photo8ooster	Thunder II GX•1360	ThunderStorm For Adobe Photoshop
Phone	404/967-2077	404/967-2077	408/954-6403	408/541-6100	408/541-6100
Toll-free phone	800/962-2077	800/962-2077	800/227-2795	800/334-3005	800/334-3005
Slot	Nu8us	PDS	PDS	Nu8us	NuBus
DSP chips[1]	AT&T DSP16A	AT&T DSP16A	AT&T DSP3210	AT&T DSP16A	AT&T DSP16A
DSP clock speed	64MHz	64MHz	66MHz	80MHz	64MHz
8undled software[2]	PowerPreview, Charger Suites Vol. 1, Xaos Tools Paint Alchemy, Kodak Photo CD Access, Storm Technology Picture Press, Imspace Systems Kudo Image 8rowser	PowerPreview, Charger Suites Vol. 1, Xaos Tools Paint Alchemy, Kodak Photo CD Access, Storm Technology Picture Press, Imspace Systems Kudo Image Browser	none	Kai's Power Tools, Apple PhotoFlash, Kodak Photo CD Aquire, Kodak Shoebox	Kodak Photo CD Access, Profiles West CD-ROM catalog, Adobe Photoshop JPEG Plug-In
Technical-support rating	good	good	excellent	good	good
List price	$749	$1999	$999	$4499	$499

Technical-support ratings are based on a series of calls made to each company by Macworld staffers (posing as customers) to gauge the accessibility, helpfulness, and accuracy of the company's support technicians. Macworld uses a point system, including bonuses and demerits, to derive the final rating. Ratings are for companies, not individual products, and we call only those companies whose products Macworld Lab tests. [1] *Each product offers dual DSP chips.* [2] *Does not include vendor's Photoshop filters*

the latter is a bit faster and works with third-party graphics boards.

Adding It All Up

If you already have 24-bit color on a Mac equipped with a Quadra PDS slot, and you simply need Photoshop filters to run faster, the Radius PhotoBooster is the way to go. The PhotoBooster offers solid performance at a reasonable price and was a favorite in lab testing because of its simple installation and straightforward operation. Don't look for any bundled software, though—unlike with the other DSP offerings, the only software that comes with a PhotoBooster are Radius's Photoshop filters.

It's tempting to recommend the Thunder II GX•1360, particularly for people who need to take an older Mac and slap it into shape as a dedicated graphics system as soon as possible. But if you compare it with the projected prices and speeds of the upcoming PowerPC models, the Thunder II GX•1360 just doesn't make sense over the long haul. At $499, though, SuperMac's ThunderStorm For Adobe Photoshop is a bargain, particularly if all you need is filter acceleration for an existing Mac with an empty NuBus slot.

The DayStar boards are solid products from a reliable company, and if you're interested in upgrading an older Mac to Quadra 840AV status and using it primarily for graphics, the Image 040 makes some sense. But otherwise, you'll probably do better spending your $1999 on a PowerPC computer. And at $749, DayStar's Charger Plus is more expensive than SuperMac's ThunderStorm For Adobe Photoshop and isn't as fast, so we don't recommend it.

No matter which DSP board seems most appropriate for you, you should have a game plan for PowerPC Macs and factor that into your buying decision. On the one hand, with a PowerPC Mac *all* your applications will run faster—an attractive reason to bypass the DSP route and head straight for a PowerPC Mac. On the other hand, the fastest DSP boards will be a match for the PowerPC offerings this spring, and several of the boards cost considerably less than a new computer. Also, a DSP board buys you some time; you get an immediate performance boost on your current Mac while you watch how the first wave of PowerPC Macs shakes out. The bottom line: If you're working on an older Mac and spend hours every day in Photoshop, you *need* a DSP board, and this is a propitious time to buy. m

CHARLES SEITER is a *Macworld* contributing editor who has designed image processing boards for biomedical imaging applications.

THE 16A AND 3210: HOW THEY DIFFER

How can a 66MHz AT&T DSP3210 accelerator show overall speed performance similar to that of an AT&T DSP16A running at a blazing 80MHz? The answer lies in how the two chips are designed.

The 3210 is AT&T's latest generation of 32-bit, floating-point DSP chips and can be used to accelerate voice, audio, and video processing in the AV Macs. The 3210 consists of several functional units, most notably the CAU (control arithmetic unit) and the DAU (data arithmetic unit). The CAU performs address calculations, branching control, integer arithmetic, and logic operations. It is a RISC core chip that consists of a 32-bit ALU (arithmetic logic unit); a 32-bit program counter; and 22 general-purpose, 32-bit registers. The DAU is the primary execution unit for signal processing algorithms and contains a 32-bit floating-point multiplier, a 40-bit floating-point adder, four 40-bit accumulators, and two control registers.

The computer's CPU passes Photoshop filter data to the 3210. The data first hits the CAU, which performs logical operations, addressing, or looping. From there it's directed to the DAU, where it's converted into floating-point instructions for processing. The results from the DAU are then passed back to the CPU memory using the addresses assigned by the CAU.

The strength of the 3210 is that it can access memory four times per instruction cycle. This process enables the DSP to get new data, manipulate it, store it, and then write it back out to memory—thus, four instructions can be in any stage of execution in one clock cycle. As a result, the 3210 is a fast chip for a variety of processing tasks.

The 16A, on the other hand, is a second-generation, 16-bit, fixed-point DSP from AT&T. It too has several components—a ROM address arithmetic unit (XAUU), a RAM address arithmetic unit (YAUU), and a DAU. The DAU sports a 16-bit parallel multiplier, a 36-bit adder, and two 36-bit accumulators—all of which yields a full 32-bit result in one instruction cycle. The data is passed from the CPU to the 16A, where it is either stored as an address in the XAUU or manipulated in the YAUU. The result then passes to one of two accumulators (a temporary cache for data) and then back to the CPU. This process is much faster on the 16A because its multiply and accumulate cycle takes only 25ns, whereas the 3210's cycle takes 60ns. The 3210 overcomes this speed difference by moving data on and off the chip in the same 60ns period, whereas the 16A uses an additional 25ns-cycle to move the data off the chip.

As the Macworld Lab results show, the Photoshop-acceleration speeds of the 3210-based PhotoBooster and the 16A-based SuperMac and DayStar Digital boards are in the same ballpark, more or less. The 3210 wins in areas such as Resize, Blur, Blur More, Sharpen, Sharpen More, and Emboss, while the 16A is faster at Rotate, Skew, Perspective, and Gaussian Blur. The 16A may only be a 16-bit processor, but with proper coding it can do the job just as well as a 3210, if not better.—**Danny Lee, with assistance from George Warner, AT&T Microelectronics senior engineer for DSP multimedia**

PHOTOSHOP ACCELERATORS

In addition to overall performance results, we considered technical support and the hardware costs in this roundup of DSP boards.

PhotoBooster In most of our tests, the PhotoBooster came out ahead of the pack. Its AT&T DSP3210 chip makes it a good choice for graphic artists who'd like to add some AV Mac functionality to their computer. Radius's tech-support staff was friendly, well informed, and prompt when answering our calls. **Company:** Radius. **List price:** $999.

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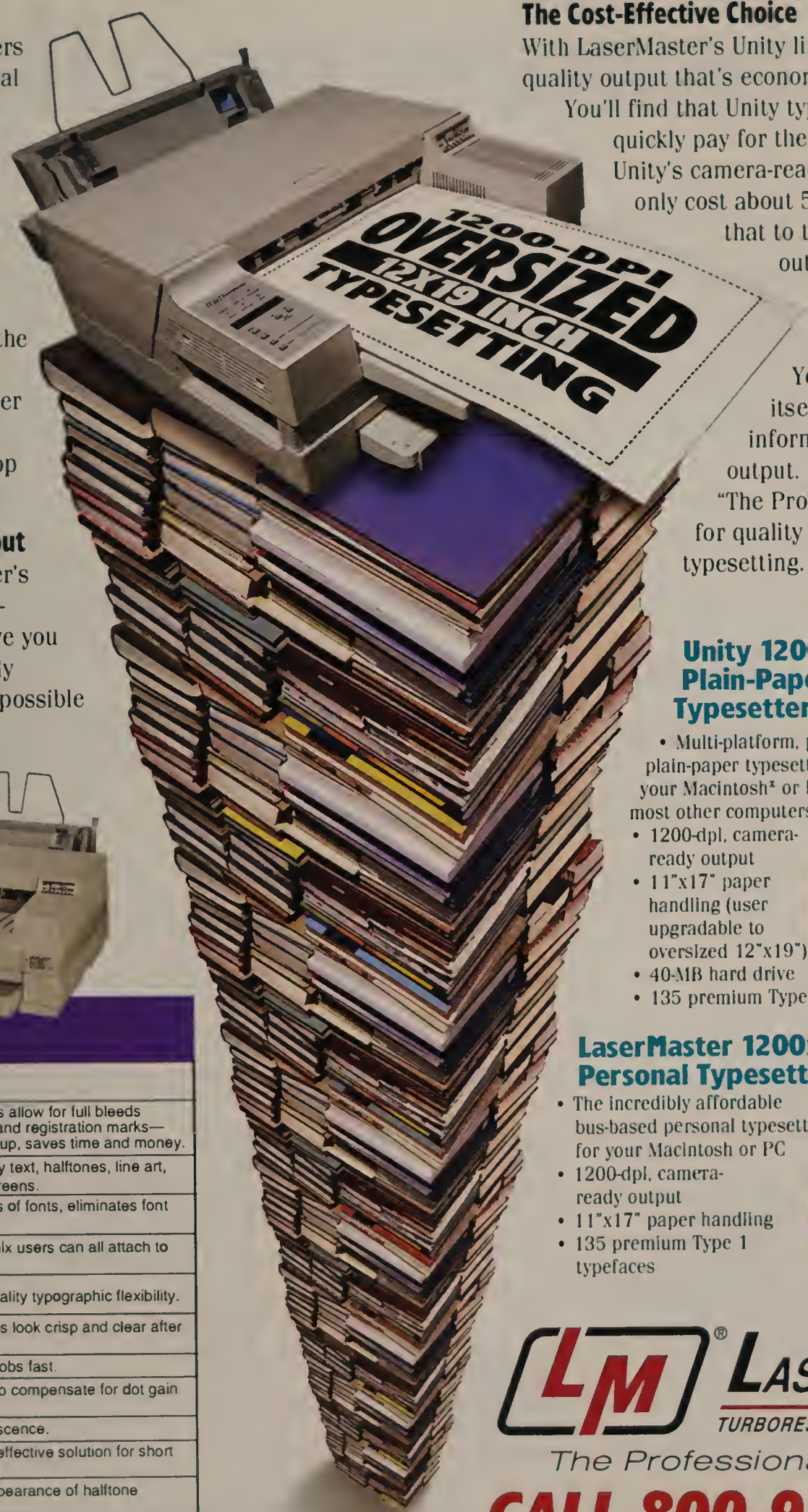

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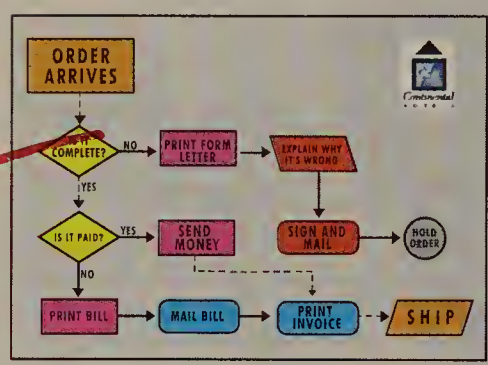

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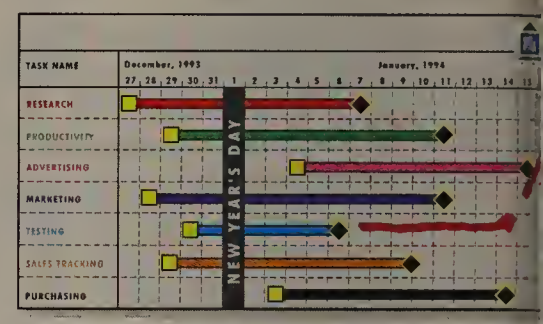

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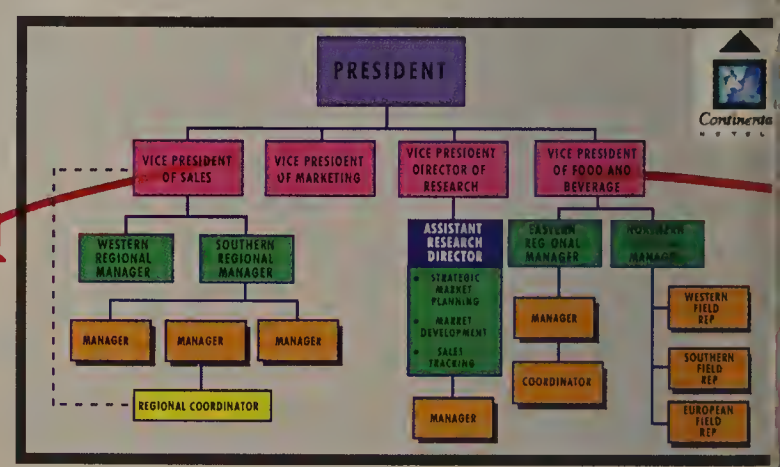

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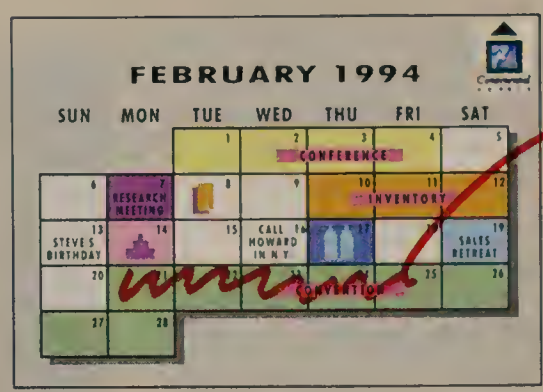

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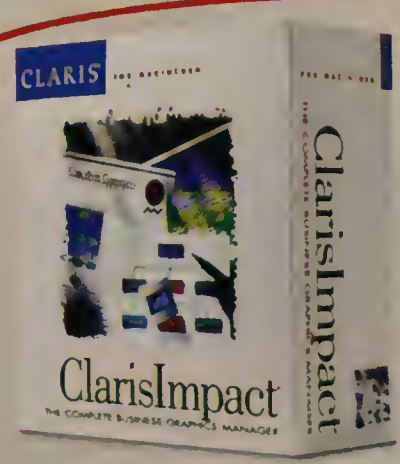

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EDITED BY DAN LITTMAN

At Work

THE LATEST TOOLS FOR BUSINESS COMPUTING

4D: More Tools, Simpler Version

ACI US IS EXPANDING THE SET OF tools available to 4D database designers and is even launching a simplified version of 4th Dimension 3.0, called 4D First, which the company hopes will woo away advanced FileMaker users. Other new products include 4D Backup, a database-backup program that can be controlled with 4D procedures, and 4D Open, a set of tools that let developers write custom front ends to 4D Server databases. 4D itself is being upgraded to version 3.1, and 4D Server to version 1.1. All should be shipping when you read this.

Like 4D, 4D First is a relational database-application generator. It can run 4D files and provides most of 4D's development tools. 4D First is single-user, supports only ten tables per database, has a simplified command set, and performs some programming tasks automatically. It lists for $295.

4D 3.1 and 4D Server 1.1 are designed for larger databases, with support for up to 256 tables per application and total file sizes up to 128GB. Server 1.1 also reduces network traffic by transferring data objects onto the client machine. 4D 3.1 remains $895; Server 1.1 pricing depends on the number of users.

4D Open provides Pascal and C libraries for use in complete programs or in middleware connections to external sources of data. Pricing for 4D Backup and 4D Open was not set at press time. ACI US, 408/252-4444.—D.L.

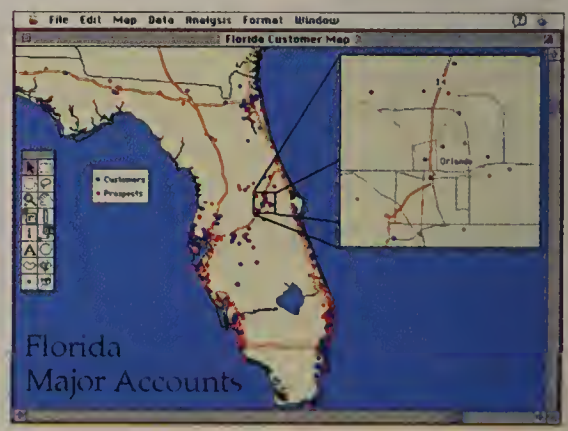
ANDREW FAULKNER

GeoQuery Hits the Streets

THE BUSINESS MAPPING TOOL GEOQuery version 4 can display streets and locate objects on maps by Zip+4 coordinates, which in urban areas are about 1500 feet apart. The new version of GeoQuery simplifies setting up sales territories and can create and report on hierarchical territories—districts that report to regions that report to divisions, for example. Like high-end mapping programs, GeoQuery now keeps data types on layers, which you can display or hide selectively to avoid overwhelming the map with detail, yet it still allows you to select and manipulate individual objects—for example, to select a competitor's sites and change their color.

GeoQuery 4.0 can display a detailed map inset on a larger map; can include data attributes, such as customers' average annual purchases, and map objects, such as road types, in the legend; and automatically uses the best projection when you zoom in or out.

GeoQuery 4.0 is $295 with state and county boundaries, interstate and U.S. highways, 5-digit zip-code centers, and more than 25,000 cities and places. The $495 GeoQuery Plus includes state highways and the Zip+4 zip-code centers. GeoQuery, 708/357-0535.—D.L.



Among GeoQuery 4.0's new features are support for insetting one map on another and displaying streets.

Language Translation for Business

COMPUTERS CAN'T GENERATE ORIGINAL human spoken or written language. Not yet. But they are getting better at translating language, at least such nonidiomatic language as business correspondence and technical documents. Globalink is now shipping translation products for the Mac that the company claims are accurate enough to reduce a translation project of several days to an hour or two of cleanup.

Power Translator Professional can read WordPerfect, Word, and text files; and can translate from English to French, German, or Spanish and from those languages to English (it can save only in WordPerfect and text formats). You can edit open files; add specialized dictionaries for translating documents about legal matters, chemicals, banking, automobiles, finance, and other topics; and create custom dictionaries.

Translating between English and each other language requires a separate $1195 version, though any version comes with a five-user license. Dictionaries range from $99 to $199, and not all dictionaries are available for all languages. The company has plans for under-$300 home and student versions called Power Translator. Globalink, 703/273-5600.—D.L.

Desktop Meetings

TWO NEW PRODUCTS ARE DESIGNED to help groups collaborate over a network—one by putting your colleagues' faces on your Mac, and the other by letting you work together on documents.

BeingThere is the software component of a videoconferencing system. It runs on any AppleTalk network and works with all standard video-capture and -digitizing devices. The company says BeingThere uses only 80K of network bandwidth to transmit 20 frames per second at 120-by-180-pixel resolution. While you watch your colleagues' talking heads, you can also choose which windows on your Mac they can see. By the time you read this, BeingThere should be shipping for $299 per person for a version that allows two users to communicate and $599 per person for a version that allows a group to communicate. Intelligence at Large, 215/387-6002.

WorldLinx's Vis-a-Vis doesn't do faces. Instead, it transfers PICT images over an AppleTalk network to members of your workgroup and provides tools for group members to annotate the images. It supports modem access using AppleTalk Remote and can also transfer files. It is shipping at $1395 for a 5-pack and $4195 for a 20-pack. WorldLinx, 416/350-1000.—D.L.

SAL DIMARCO

Videoconferencing over Ethernet with BeingThere, from Intelligence at Large; Axion iSpy cameras; and AV Macintoshes. Both participants can see the Excel window at lower right.

IN BRIEF

■ **The Ubiquitous Dynodex** Portfolio Systems is upgrading Dynodex to version 3.5. The new version features a control panel called Dynofind that puts a search menu on the menu bar in every application, and frequently used names can be quickly added to the Dynofind menu for instant access. The new version also adds a layout view that simplifies accessing and modifying layouts. Dynodex 3.5 should be shipping for $69.95 as you read this. Portfolio Systems, 802/865-2700.

■ **Rae Assist Accelerated** Rae Technology plans to ship Rae Assist 1.5 in the first quarter of 1994. The company says the new version of its personal information manager is much faster at finding information and at switching between People, Planner, and the other sections. The new version can search across all sections at once and opens a miniwindow with the data found. The Planner has also been redesigned with standard day and week views. Rae Assist's price remains $199, and it is $29 to upgrade. 408/725-2850.

Bar-Code Bazaar

VERTICAL TECHNOLOGIES IS DEVELOPING a soup-to-nuts suite of products for working with bar codes.

Bar-One is software for designing and printing bar-code labels. It provides tools for laying out labels and adding text and graphics. Bar-One Basic can print five common bar-code types as well as POSTNET mailing bar codes, and can increment label numbers; Bar-One Professional adds eight more bar-code types, can print multiple copies if needed, and supports text variables. Both versions should ship in February, Basic for about $100 and Professional for about $400.

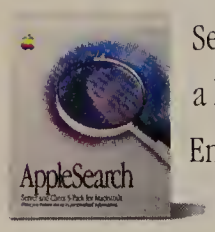
To read bar codes, the Scan-One (a Hewlett-Packard wand that attaches to the serial port) will be sold by Vertical Technologies for about $225, and the Wedge-One (an ADB device that includes an HP wand) for about $350. The Scan-One can be programmed to perform such tasks as adding field delimiters when the scanner reads in different data on the label.

Track-One is a Microsoft FoxPro–based database that can store bar-code information and provides searching and reporting capabilities. Track-One Basic ($195) has 7 fields per record. Track-One Professional ($495) has 999 fields, can validate data as it is entered, and is highly customizable. All products should be available in the first quarter. Vertical Technologies, 801/969-0081.—D.L.

TOM GIBSON

The Wedge-One bar-code reader with its ADB interface (left), and the wand-only Scan-One. Both use HP wands.

If there's a needle in here, AppleSearch will find it.



Searching for information on a computer network can be a lot like looking for the proverbial needle in a haystack. Enter a pitchfork with a serious attitude: AppleSearch™. Powerful new information-retrieval software designed to dig easily into the wealth of data residing across your office network. AppleSearch turns a typical file server into a rather untypical knowledge server. It quickly explores your entire AppleTalk® network in search of information on any topic you may select. And more important, hones in on precisely the pieces you need. It's incredibly easy to use. Even first-time users can start searches by creating "Reporters" with simple English queries like "Find all references to volcanic activity in the South Pacific." The Reporters do the rest. They scan through a range of selected data, documents and information sources—such as servers, on-line services, news feeds, even CD-ROMs—in search of whatever subject you're interested in.

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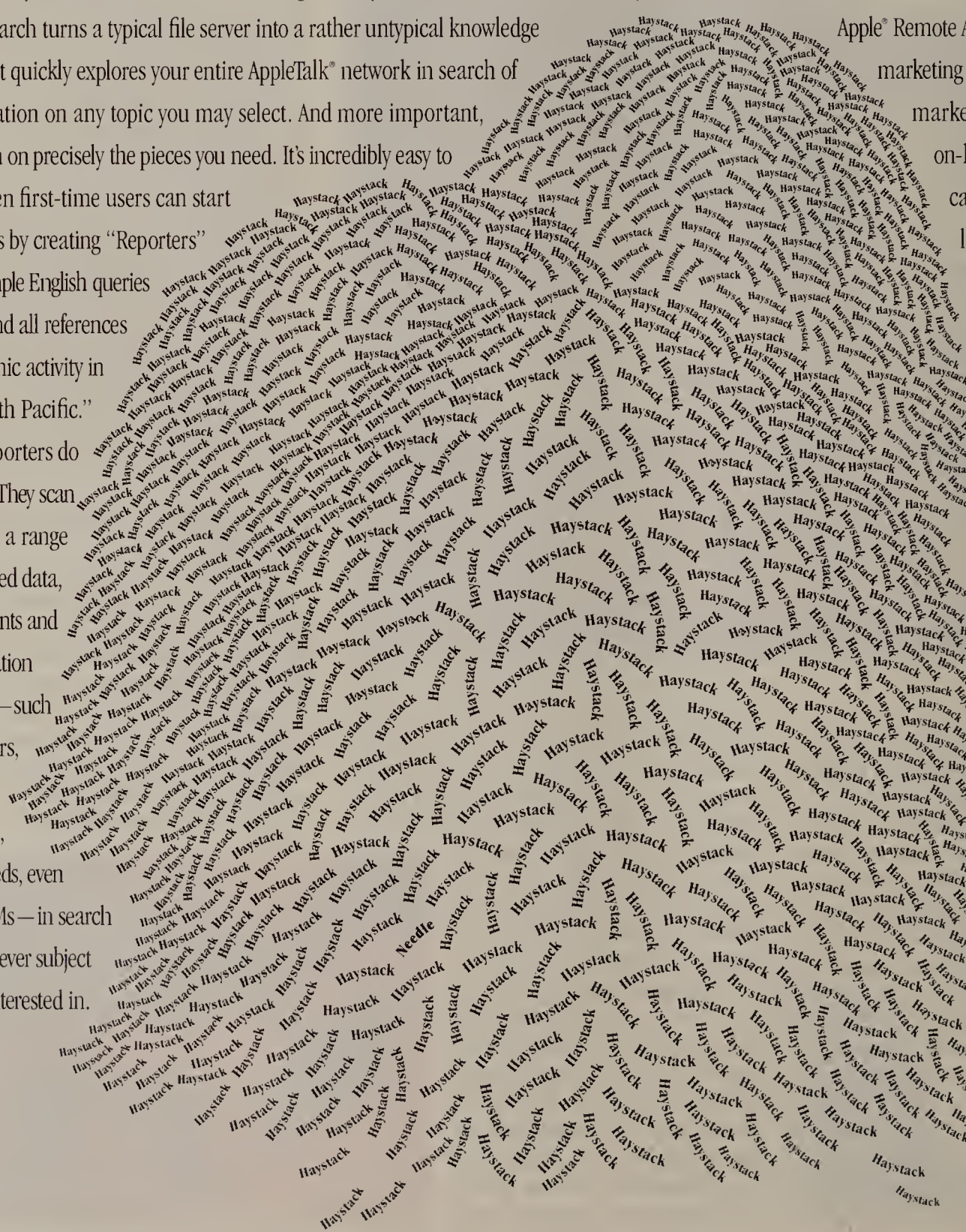

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BY JIM HEID

Working Smart

Smart Backup Strategies

THE DATA YOU BUILD YOUR BUSINESS ON is prone to attack by fire, water, earthquake, lightning, thieves, and computer viruses. But relax: most data loss is caused by less dramatic mishaps, such as a dead power supply that leaves a drive's contents temporarily inaccessible. Sometimes the loss is a mystery—one day your files are there, and the next day they aren't. Whatever the cause, someday you'll sit down at your Mac to discover your files are gone. What effect would that have on your business? Could you recover and get back to work? If you don't have a backup handy, the answer is probably no.

Like Secret Service agents and air-traffic controllers, computer users should be appropriately paranoid. Having said that, I must confess that I'm as guilty of not backing up as most people, and for the same reasons. There's laziness—at day's end, I can't choose Shut Down fast enough. There's economics—hard drives hold too much to make floppy disks a workable backup medium, so that means buying extra equipment. And there's that typical, unfounded human faith—it can't happen to me. Fortunately, it isn't so tough to he prepared for the moment when it does happen to you. The key is to have a good backup strategy in place before the crisis occurs.

What to Back Up

Your Documents Of all the files on a hard drive, none are more valuable than your documents. You can reinstall applications and system software from the disks they came on, but for documents you created there is no such safety net. So if you're going to back up only one type of file, make it your documents.

There are several ways to do a documents-only backup, and some of them don't even require a backup program. One technique: use the Finder to copy the folders for your current projects (you do group related documents into folders, don't you?) to a floppy disk or cartridge. To see which folders have been recently modified, choose By Date from the Finder's View menu—your backup candidates appear at the top of the list.

If you have a SyQuest, Bernoulli, or magneto-optical cartridge drive, reformat your disk drive with partitions of the same capacity as a cartridge, and use the Finder to copy the partition with your documents onto a cartridge. (You'll probably need to back up and then reinitialize your hard drive before you can partition it; for details, see "Hard-Drive Optimizers," *Macworld*, March 1994.)

All backup programs also let you specify a documents-only backup, usually by excluding application programs and the System Folder. Most backup programs also let you choose to back up a specific folder, usually by manually selecting it (see "Selecting by Hand").

Your System Folder Your System Folder is a reflection of the way you use your Mac. You can reinstall the basic System Folder from original disks, but you'll still be missing fonts, special control panels, extensions, preference settings, and perhaps customized spelling dictionaries.

Floppies are a bit impractical for backing up a System Folder, which can easily devour a dozen megabytes or more, but a backup program can help. The first time you run the backup program, you have to hand-feed a couple dozen floppies, but from then on you can do an incremental backup, which backs up only the files that have changed.

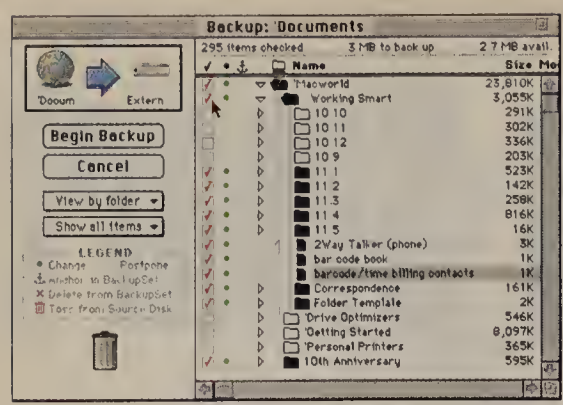
If you have a removable-media drive of some kind, backing up the System Folder is easy. You can use the Finder to copy the entire System Folder to a cartridge, or use a backup utility to back up the entire System Folder and then make incremental backups now and then.

Everything The best way to back up is to create what's sometimes called a mirror-image backup of your entire hard drive. A mirror-image backup preserves the entire state of a hard drive, from the depths of the System Folder to the positions of icons and windows on the desktop. Restore a mirror-image backup on a new hard drive and you're ready to go.

To back up a good-size drive, you need some type of backup medium besides floppies. A tape drive or a second hard drive of equal or greater size requires no cartridge juggling and is therefore the most convenient, although a removable-media drive whose cartridges store 80MB or more may be workable, particularly if your backup program compresses files. (The FastBack and Retrospect series, Redux Deluxe, and the backup programs that accompany Symantec's Norton Utilities and Central Point Software's MacTools all offer compression.)

The easiest way to create mirror-image backups is to use two hard drives

continues



Selecting by Hand Most backup programs let you specify certain files and folders to back up. The selection window in Redux Deluxe is shown here; items whose boxes are checked will be backed up.

with disk-mirroring software, such as Golden Triangle's DiskTwin, to create a backup as you're using your Mac. With such a setup, if one hard drive fails, you can replace it with the other one immediately. Disk mirroring can be ideal for office file servers and other extremely critical systems, but it doesn't obviate the need for conventional backups—unless you can convince a fire, flood, or thief to take only one of the two drives.

Timing Your Backups

Once you have a complete backup, you keep it up-to-date by doing an incremental backup now and then. How much time elapses between "now" and "then" determines the strength of your data's safety net. Deciding how often to back up is like deciding how large a deductible you want on an insurance policy. Backing up daily is like having a small deductible: you pay a higher premium (by spending more time backing up), but you have better insurance when the worst happens.

Regardless of how often you back up, it's a good idea to alternate between two or more sets of backup media—if one set goes south, you'll have another to fall back on. To help reinforce regular backups, many backup programs include a system extension that kicks in at a time you specify or when you choose Shut Down, displaying a dialog box that asks if you want to back up. (All the programs in this article include this type of extension except DiskFit Direct.)

Backing Up the Office

In offices with multiple Macs connected to file servers, you need a backup policy. Will each user be responsible for backing up his or her own machine? Will users back up to the file server? Who's responsible for backing up the server?

Making each person responsible for his or her own backups is the easiest approach but also the riskiest. Some people just won't do it, and when their drives fail, the entire business suffers.

Backing up to a file server has advantages and disadvantages. On the plus side, you don't need a specialized backup device at each workstation—just buy one tape drive for the file server. You can also enforce a stricter backup regimen, either by installing an automatic backup extension on each machine or by using Dantz Development's Retrospect Remote, which lets a network administrator back up users' workstations from the administrator's Mac. A third advantage is that all your backup data is stored in one place.

But putting all your digital eggs in one basket makes backing up the server all the more critical. Another drawback is the additional traffic that backing up over the network generates. To avoid slowing down your office's information highway, back up at night or on weekends. Another drawback to network backup is that your server probably isn't big enough for everyone's entire hard drive.

Regardless of who is responsible for backing up the server, make sure at least two other people know how to restore files from the backups. You don't want to be out of business just because the person who backs up is out of the office.

Protection for the Paranoid

A rigid backup regimen is worthless if backups are damaged or stolen along with the originals. That's why data processing professionals practice off-site storage—stashing a set of backups somewhere else.

In the data processing world, some-

continues

UNDERSTANDING BACKUP PROGRAMS

Mac backup programs range from the simple to the sophisticated. At the low end is Dantz Development's DiskFit Direct. In the middle ground are Dantz's DiskFit Pro, Inline Software's Redux Deluxe, and the backup programs included with Symantec's Norton Utilities for Macintosh and Central Point Software's MacTools. The upper deck is inhabited by Dantz's Retrospect series and Symantec's FastBack Plus.

Here's an overview of the features that set these tiers apart.

Backup selectivity Low-end programs give you little control over which files are backed up. DiskFit Direct, for instance, backs up an entire drive—you can't specify a certain folder or certain types of files. More-sophisticated programs provide a dialog box or a browser window for selecting files and folders.

File compression Most programs can store backup files in a compressed form. This requires less storage capacity, but you must use the backup utility to restore files, and if your backup becomes corrupted, the files are almost impossible to rescue. DiskFit and DiskFit Pro store files in Finder-readable format. The FastBack series strikes a happy medium here: you can create self-extracting backup files that can be restored without having FastBack installed.

Tape drive support If you opt for a tape drive, you'll need FastBack Plus or Retrospect (the latter is included with many tape drives), because other backup programs don't support tape.

Encryption The Retrospect series can encrypt backups, but don't encrypt unless you must. Restoring files during a data crisis is hard enough—dealing with encrypted data and passwords only complicates things.

Archiving Instead of backing up files, FastBack Plus and the Retrospect series can move files to an archive on backup media and then delete the originals—handy for spring cleaning.

Support for AppleShare and System 7 file-sharing settings On a network, it's important to back up the access privileges for files and folders. Midrange and high-end programs provide better support for access privileges.

Scripting and automation Redux Deluxe and the high-end backup programs let you automate complex backup sessions with a simple language or by setting parameters in dialog boxes.

There are also some unique alternatives to the programs mentioned above. Dayna Communications' SafeDeposit backs up in real time, but unlike a mirroring program, SafeDeposit doesn't delete a file's backup when you delete the original. Symantec's CopyDoubler is designed primarily to speed up file copying in the Finder, but you can use its scheduled copy feature to make backups at regular intervals or when you shut down. And Aladdin Systems' StuffIt Deluxe compression utility includes scripts that can compress folders and then copy the archives to other drives.

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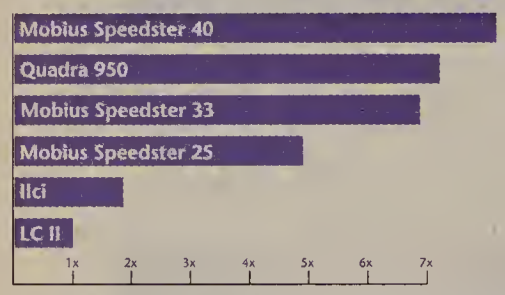

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Backup Media Pros and Cons

Medium	Pros	Cons
SyQuest or Bernoulli cartridges	Versatile. Drives and cartridges can also be used for primary storage. Inexpensive.	Multiple cartridges required to back up most drives.
Magneto-optical drives	High capacity. Some are fast enough for primary storage. Better than magnetic media for long-term archiving.	Drives and cartridges are more expensive than SyQuest, Bernoulli, or tape drives.
WORM drives	High capacity. Ideal for archiving, since recorded data can't be erased or altered.	Costly. Not suitable for incremental backups.
Tape drives	Tapes are inexpensive and can hold more than 1GB.	Usable for backup only. Restores can be slow.

where else is usually secure storage facilities such as those operated by Iron Mountain (617/357-6966) and other firms. Couriers pick up backup media at intervals specified by the customer, seal them, and take them to a guarded facility with climate-controlled vaults, motion detectors, and other security systems. (Some sites are carved into caves or mountains and were designed to survive World War III.) If the backups are needed, a courier delivers them within a couple of hours. Iron Mountain says a minimum charge for its services is roughly $75 to $100 per month.

This kind of off-site security is essential for big business, but it is overkill or just too costly for most of us. A safe-deposit box is one economical alternative. A corner of a sock drawer costs even less. Just don't keep all your backups in one place.

WHERE TO BUY

CopyDoubler 2.0 $109 (sold only in the SuperDoubler 1.0 bundle, which also includes AutoDoubler 2.0 and DiskDoubler 4.0); **FastBack Plus 3.0** $149; **Norton Utilities for Macintosh 2.0** $149; Symantec Corporation, 408/253-9600, 800/441-7234.

DiskFit Direct 1.0 $49.95; **DiskFit Pro 1.1** $125; **Retrospect 2.0** $249; **Retrospect Remote 2.0** $449 for first ten users; Dantz Development Corporation, 510/253-3000, 800/225-4880.

DiskTwin 2.0 $999; Golden Triangle Computers, 619/587-0110, 800/326-1858.

MacTools 3.0 $149; Central Point Software, 503/690-8090, 800/937-9842.

Redux Deluxe 2.0.1 $79.95; Inline Software, 203/435-4995, 800/453-7671.

SafeDeposit 1.3 $129; Dayna Communications, 801/269-7200, 800/531-0600.

StuffIt Deluxe 3.07 $120; Aladdin Systems, 408/761-6200.

More Backup Tips

Here are a few more tips.

- Test restoring some data occasionally to make sure everything's working properly. Borrow a hard drive and try restoring a folder full of files to it. You'll know what to do when the worst happens.
- Use your backup program's verification feature to ensure that the backup is written to disk or tape accurately. This slows down the backup process, but that's a small price to pay for reliability.
- Create an emergency start-up floppy. With your hard drive out of commission, you'll need this floppy to start up your Mac and run the backup program. Be sure the floppy contains any required System Enablers. The Disk Tools floppy that came with your Mac can also be used as an emergency start-up disk.

Even if you don't rotate between multiple backup sets, establish emergency procedures for your office, or practice off-site storage, do *something*. At least back up your most important documents on a floppy and throw the floppy in your briefcase when you turn off your Mac. Even an insurance policy with a high deductible is better than no insurance at all. **m**

Next Month: Creating Tables

Contributing editor JIM HEID has been writing about the Mac since its introduction. His most recent book, *Macworld Complete Mac Handbook + CD*, is published by IDG Books Worldwide.

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File

SIX TECHNIQUES TO HELP YOU WORK LIKE A DATABASE PRO

by Rich Coulombre and Jonathan Price

THE BUZZ OF A HANDSAW, THE FLASH OF knitting needles, the taste of tomatoes from the backyard garden: fact is, most of us office workers love to provide basic necessities for ourselves—when we have the opportunity. And the satisfaction we derive from self-reliance is just as important in business, where it has other benefits as well.

It is probably wise to farm out the development of your company's central database to an experienced database expert. That gets you an efficient system—though you lose control over its design, and you pay cash for every modification. But there's lots of information that doesn't belong in a central database, and you'd be surprised how much of it you can manage on your own with databases created in FileMaker, especially after you learn the half-dozen sophisticated tricks described here. (FileMaker Pro 2.1 is $399 from Claris Corporation; 408/727-8227, 800/325-2747.)

How to Make a Name

It shouldn't be that hard to center the first name, middle initial, and last name on a label. But if you

Maker Workshop

put all three fields in a row and format each field as centered, you wind up with uneven gaps between the fields, and the Slide Objects command doesn't help very much.

Text calculations are the solution. Create a new calculation field and call it Full Name, set the result to Text, use the formula described below to put the full name in the full-name field, and center the result (see "Calculating Text"). The formula uses the ampersand (&) operator to combine multiple fields. To get a space to appear between two fields in the result, put a space character inside quotation marks in the formula—FileMaker copies anything in quotes exactly, instead of trying to evaluate it for use in the calculation. (Otherwise FileMaker ignores spaces in the calculation, so you can use spaces to separate parts and make the calculation more legible.) Since some records will lack a middle initial, add an If function that tells FileMaker to enter nothing if the middle-initial field is empty, but otherwise to enter the field's contents and follow it with a space.

Here's the complete formula—note that we're using a caret (^) to indicate a space that will appear in the result, but be sure to use real spaces when you create the formula.

```
First Name & "^" & If (Middle Initial =
"","", Middle Initial & "^" ) & Last Name
```

The If function tests to see if the middle-initial field is empty. Inside the parentheses, separated by commas, are arguments—instructions for what to do next. When you first select the If function, it appears with placeholders (test, result one, result two) for the arguments you need to put in. You replace the word *test* with the test you're making (here we are asking if the middle-initial field is empty), replace the words *result one* with what to put in the full-name field if the answer is yes (here nothing), and replace *result two* with what to put in if the answer is no (here the initial and a blank space).

If you get frustrated designing layouts because your fields never line up quite where you want them, you can go even further and have FileMaker combine a name and address into one field. Include carriage-return symbols ("¶", accessed with option-7 or by clicking on the icon in the Field Options dialog box) to start new lines.

FileMaker to Mainframe

Do you have information stored in FileMaker that your information systems department wants to move onto the corporate mainframe? You could export a file in tab-delimited format and let the MIS department worry about converting it to the mainframe's fixed-length format, but FileMaker can easily do the conversion. (The fixed-length format is a survivor from the punched-card era, but fixed-length data is ideal for batch processing because the computer doesn't need to waste time looking for field delimiters—it knows where each piece of information starts and ends by its length.) Using FileMaker's Left function, you can generate, for example, a 26-character name field that designates a specified number of spaces for each component—first name, middle initial, and last name. It places the first name in the first 10 spaces and adds blank spaces, if needed, to fill out the 10 spaces designated; puts the middle initial in space 11; and reserves spaces 12 through 26 for the last name plus blank spaces, if needed.

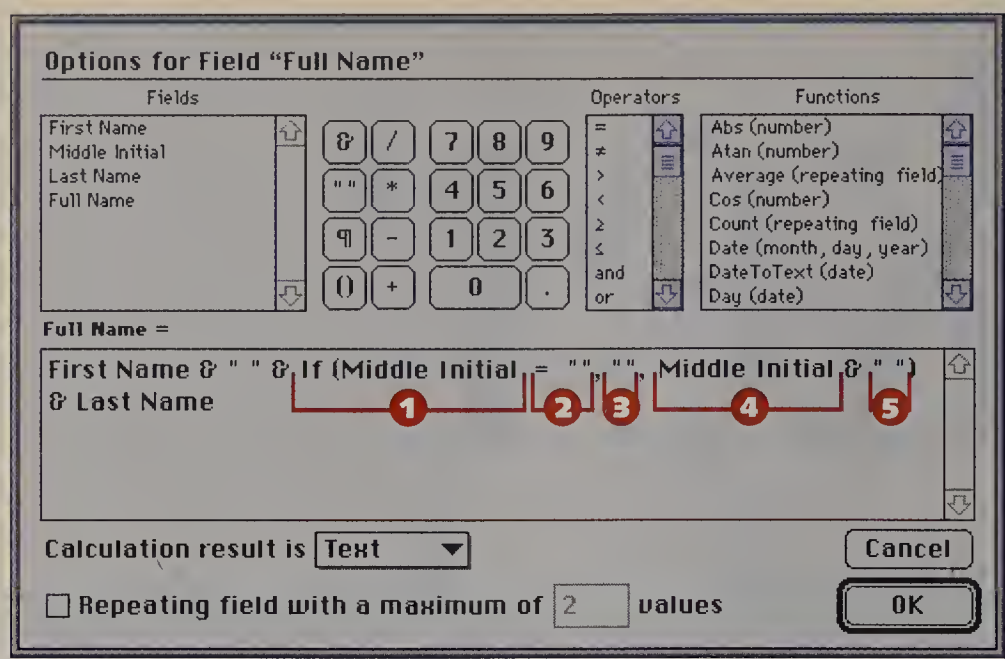
Here's the calculation:

```
Left (First Name & "^^^^^^^^^^",10) &
Left (Middle Initial & "^",1) & Left (Last
Name & "^^^^^^^^^^^^^^^",15)
```

The calculation takes the value in the first-name field, adds 10 space characters (remember to use real spaces, not the caret symbol) at the end (this ensures that the field has at least 10 characters even if the original was empty), and then selects the leftmost 10 characters from that result (the 10 to the right of the comma is the argument telling FileMaker how many characters to select). The calculation then repeats the process for the middle-initial and last-name fields, and your data is ready for the corporate database.

The Deadline Database

If your company lives and dies by deadlines, you can use a simple FileMaker calculation that works back-



Calculating Text FileMaker's Field Options dialog box shows a calculation that combines the first-name, middle-initial, and last-name fields into the new full-name field.The If function (**1**) tests the middle-initial field to see if it is empty (**2**); if so, the function enters nothing (**3**) in the full-name field. If it finds a value (**4**), it enters that value and follows it with a blank space (**5**).

ward from a final deadline to schedule intermediate events and milestones.

Let's say you already have a date field called Final Deadline. Now define a calculation field called Complete Milestone. Enter

Final Deadline - 60

Make sure you set the result to Date or you'll get some pretty wild results. This calculation tells FileMaker to count back 60 days from the date in the final-deadline field and express that day as a date—that's the date you should complete the milestone. You can create a series of fields like this to produce a set of dependent deadlines. Now add fields for when scheduled tasks were actually completed, and you're halfway to a progress or slippage report.

Of course, this formula assumes that the interval between the milestone and the final deadline is static. If it changes with every project, you could create another field called Interval and enter a different figure each time. So now the formula for Complete Milestone would read

Final Deadline - Interval

To avoid the milestone date's landing on a weekend, use the DayName function to check the day of the week. Create a new calculation field called Weekday Milestone and set it up to subtract one day from the due date if the date lands on a Saturday and to subtract two days if it lands on a Sunday. Here's the formula:

If (DayName (Complete Milestone) = "Saturday", Complete Milestone - 1, If (DayName (Complete Milestone) = "Sunday", Complete Milestone - 2, Complete Milestone))

This will move all Sunday and Saturday deadlines to the preceding Friday. Why are there two parentheses at the end of the calculation? Because you have nested one If function as an argument inside another If function.

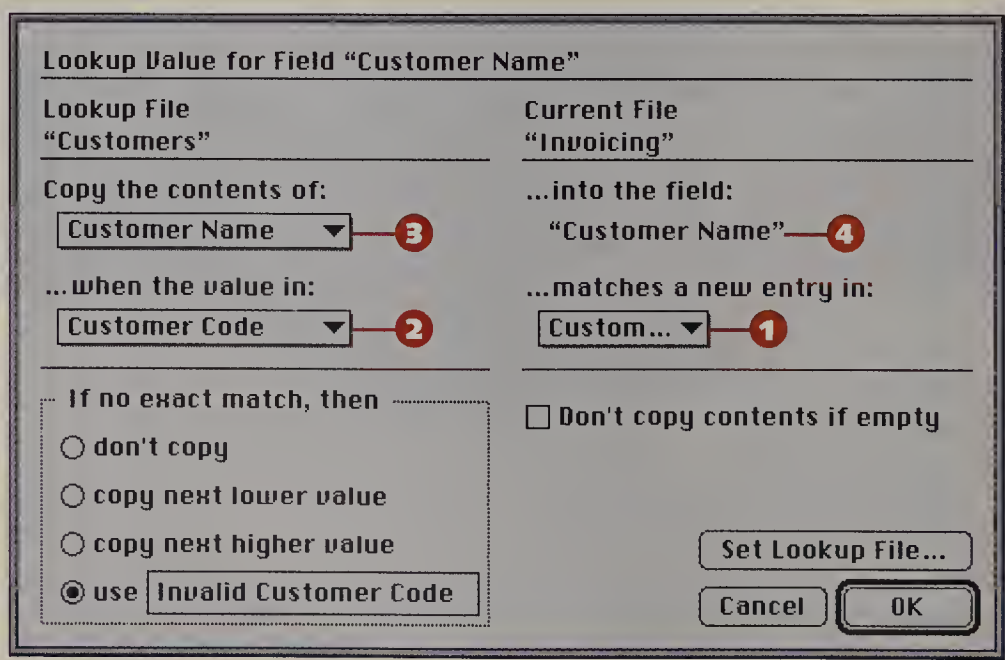
Automating with Lookups

You can simplify data entry and make sure that static information, such as a customer's address or a product description, is entered accurately in your invoice and billing database by looking up the information in other FileMaker databases. For example, when you enter a customer's account number in the customer-ID field on a new invoice, FileMaker could look up the customer's name, address, and perhaps even the customer's standard discount, from another database and copy that information into the appropriate fields in the invoice database.

As you define fields in the invoice database, you can make them trigger a lookup by choosing the option to look up values from a file, selecting the database containing the static information, and then using pop-up menus to link the appropriate fields (see "Look It Up"). A great secret about FileMaker's lookups is that you can override them. If you need to change the description of a service rendered to ensure that the client will recognize the work, you can just type right over it.

A few lookup cautions: If the lookup file contains multiple records with the right value in the matching field, FileMaker gives you the data from the first record it finds—that's why it's a good idea to base lookups on a field that won't be duplicated, such as customer ID number, instead of a field that might be, such as name. (To make sure you don't give the same customer ID number to two customers, check the option to verify that the field value is unique in the Entry Options dialog box.) Also, lookup fields and lookup trigger fields must be of the same type as the fields they reference in the other database.

By the way, people often attempt to use FileMaker lookups to create a full-fledged accounting system, but you can't turn FileMaker into a double-entry accounting system because it's not truly relational. If you change information in the lookup file—for example, a customer's address—you must update all records that looked up that information by finding them, clicking in the field that triggers the lookup, and then choosing Relookup from the Edit menu. None of this is automatic, as it would be in a true



Look It Up The logic of FileMaker's Set Lookup dialog box runs clockwise from the bottom right. Data entered in the Invoicing file's customer-code field (**1**) is compared with the Customers file's customer-code field (**2**). If they match, the Customers file's Customer-name field (**3**) is copied back into the Invoicing file's customer-name field (**4**).

relational database, and there is no audit trail to keep you (or your employees) honest. So FileMaker lookups work best for onetime transfers of information, as in invoicing.

Database Publishing

Do you still keep your company's phone list in a text file? Keeping it in FileMaker and creating a report to publish it will eliminate all the layout, formatting, and other work you have to do every time a position moves to a different department or someone new joins the company.

The real power of keeping this information in FileMaker emerges with the program's subsummary feature, which enables you to prepare layouts that automatically group records by any attribute recorded in the database. For example, a database of employees probably includes a field for city; subsummaries let you sort the database on the city field and then print a list of employees grouped by city, with the city name appearing once at the beginning of each group.

In Layout mode, create a directory layout, drag a part icon between the header part and the body part, and when the Part Definition dialog box comes up, choose Sub-Summary. Be sure to sort by the city field—if you don't, FileMaker won't summarize the data correctly. You can also tell FileMaker to force a page break before each new city, so each city starts at the top of a new page. Then drag a field icon to the subsummary in the layout and, when the list of field names comes up, choose the city field—that will make the city print once at the top of the section (see "Sub-Summary Parts").

To make the directory even easier to read, you can use a second subsummary with a simple text calculation that displays the first letter of each group of last names after they have been sorted alphabetically—for example, putting a large *A* before Abercrombie, Ames, and Ardrey and a large *B* before Barron, Blackwell, and Brucker. To make this work, create a calculation field with the following formula:

Left(Last Name,1)

Place the field in the subsummary and format it big and bold so that people can easily skip around the alphabet, say, to the *F*s or the *P*s.

Telephone Directory

Boston
72 Employees

A
Archarni, Deborah (617) 555-4661
Armolc, Roy (617) 555-5766

B
Barosshair, Robert (617) 555-4165
Bedig, Ron (617) 555-8019
Bershon, James (617) 555-7289
Bohmbach, Richarc (617) 555-4169
Brooks, Jennifer (617) 555-1830

Crompton, Lynne (617) 555-9321

D
Dailey, Paul (617) 555-8047
Doyle, Kevin (617) 555-8079
Drisco, Ir: (617) 555-3317

E
Eurit, Dottie (617) 555-4560

F
Finnerar, Dottie (617) 555-2193
Flanner, Leo (617) 555-1140

Hughes, Art (617) 555-2501

J
Jacques-Foster, Dan (617) 555-7174

K
Kell, Car (617) 555-2087
Kollmeye, Aaron (617) 555-8610
Kollmeye, Deborah (617) 555-3069
Kollmeye, Evan (617) 555-2187
Kollmeye, Rick (617) 555-5798
Kulic, Robert (617) 555-5596

Sub-Summary Parts This columnar layout (top) uses two Sub-Summary Parts. the first groups records by location and displays the city name at the top of each page, and the second displays a bold initial for each letter of the alphabet. Below the telephone directory is sample output of the document produced using Sub-Summary Parts.

One-Button Reports

To make sure you sort the database and switch to the correct layout before printing your directory, create a script and embed it in a button. A script is essentially a snapshot of the state of your database

PRECONFIGURED FILEMAKER DATABASE TEMPLATES

Templates offer something in between a custom-designed database and a completely do-it-yourself system. Here are a few strong FileMaker business templates; for information on more templates, get the free *Claris Solutions Alliance Directory* (Claris, 408/727-8227, 800/325-2747).

Main Events $1595; Watertechnics Consultants, 408/761-3987, 800/779-1739.

If you put on events—training workshops, awards banquets, sales meetings, conventions—you'll recognize the in-depth experience in the well-designed screens and clear, logical flow of this database. The system includes forms for tracking contacts with participants, hotel personnel, and suppliers, and provides badges, confirmation letters, and even certificates of completion. No detail is too small: if you wind up canceling the event, Main Events tells you how much money you have lost.

Down To Business 2.05 $149; Packer Software, 203/535-2666, 800/782-9955.

You can run a small business with this package just by clicking on buttons. Down To Business includes invoicing, receivables, customer tracking, contact management, purchasing, payables, inventory control, and employee management (sick days and evaluations, for example). It provides dozens of views of your data (from aged payables to orders not yet received), uses plenty of lookups to automate data entry, and has powerful extras, such as showing you the unit profit when you price an inventory item. Down To Business is almost a complete accounting package, but lacks GL and payroll, and does not offer double-entry bookkeeping.

Biz Basics EZ 2.0v2 and **Biz Basics Pro 2.1** EZ $249, Pro $398; Working Solutionz, 805/522-2170.

Biz Basics EZ is designed for businesses that sell services, and Pro is more suitable for businesses that sell inventory. Pro adds features such as custom payment terms; component-level inventory; and Shipper, an add-on that does automatic lookups for UPS and mail delivery rates. Pro also lets you enter phone orders and spin off work orders for the shop floor, then generate invoices one at a time or in a batch. You can easily preview a shipping label, and the system can handle separate ship-to and bill-to addresses.

when the script is created; running the script returns the user to the layout, page setup, sorting, and anything else you have configured. Here's how to create the script.

First set everything up the way you want it: Switch to the right layout; configure the page setup; sort the database (sort by city first, then by last name). To record print settings, issue the Print command, check Records Being Browsed and whatever other options you need, and then abort the print job with ⌘-period (.)—don't back out by clicking on the Cancel button or FileMaker won't record your print setting in the script.

Now choose ScriptMaker from the Scripts menu and name the script something like Print Directory. To allow anyone to run the script, choose the following options from the dialog box:

- **Enter Browse Mode** The script can't run unless the database is in Browse mode.
- **Go to Layout** Choose the directory layout—the user might be on a different layout.
- **Page Setup** Choose the Restore, No Dialog option to set up the print dialog box as you want it without showing the dialog box on screen.
- **Sort** Choose Restore, No Dialog to run the sorts you set up.
- **Print** Choose No Dialog.
- **Unsort** This puts the records back in their previous order after printing.
- **Go to Layout** Choose Original Layout—this returns the database to the layout the user was on.

Now that you have written the script, go to Layout mode, import a graphic (such as an image of a printer), select it, and choose Define Button. In the dialog box, choose Perform Script and attach your new script. You can put this button on as many layouts as you want.

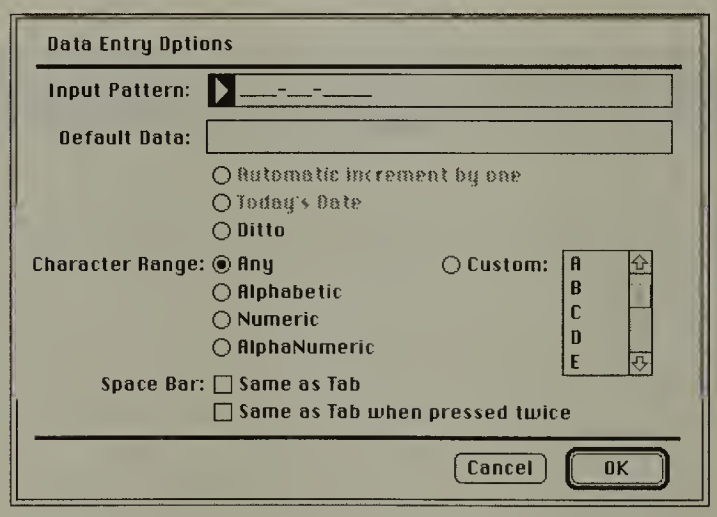
With these FileMaker tips, you'll be able to add powerful new capabilities to your databases, and you'll still have the freedom to design databases that look and act the way you want them to. While we've described applying text and date calculations, lookups, Sub-Summary Parts, scripts, and buttons to solving specific tasks, once you try these features out you'll find it easy to generalize and use them in all kinds of situations. **m**

RICH COULOMBRE is co-owner of The Support Group, a microcomputer training and database development organization based in Newton, Massachusetts. JONATHAN PRICE runs The Communication Circle, an international business that consults on documentation, online help, and information recycling. Their book, *FileMaker Pro 2.0 for the Macintosh*, was recently published by Addison-Wesley.

PANORAMA POWER

Some of the stickiest and most repetitive tasks that database users face can be automated away by creating the database with FileMaker's increasingly popular rival, Panorama 2.1.2 ($395, ProVue Development, 714/892-8199, 800/966-7878). Although FileMaker and Panorama are similar in many ways, the latter is equipped with some unique features that can greatly streamline building and maintaining a database. Here is a sampling.

- **Clairvoyance** As you enter data, Panorama checks the characters you're typing against data already in the database. The moment Panorama recognizes a sequence of characters, it anticipates the intended entry and finishes typing it for you, which ensures consistency among entries and also saves time and keystrokes.
- **Multiple windows** In Panorama you can view several layouts simultaneously. You can also equip each window as you like, with or without scroll bars, tool bar, drag bar, and close box. This flexibility gives you more control over how others use the database. Removing scroll bars, for example, makes sure users focus on a particular portion of a layout.
- **Input patterns** Panorama can automatically format numbers and text according to a pattern of punctuation and spacing you define. For example, you can set up a phone-number field to insert parentheses, dashes, and spaces so that the user can key in only the digits for each phone number (see "Panorama's Input Patterns").



Panorama's Input Patterns Panorama can format data according to a predefined pattern as data is being input. This example shows a field preformatted for Social Security numbers: it automatically inserts dashes after you type the third and fifth digits.

- **Self-activating macros** Panorama's scripting capabilities include PanTalk, a full-fledged language you can use to build complex macros. And you can set macros to run automatically when certain events occur, such as whenever a particular window is closed or a new record is added.
- **Spacebar tabbing** For those who routinely enter large amounts of data, this feature is nothing less than brilliant. You can set Panorama to move from field to field when users press the spacebar instead of the tab key. (You can also set it to move to the next field when the spacebar is pressed twice.) With the spacebar option, when users press the spacebar once between entering the first name and the last name, Panorama enters the data in two separate fields.
- **Text entry in date fields** Panorama offers a unique no-brainer approach to entering dates in date fields: type in words like *today*, *tomorrow*, or *next Wednesday*, and Panorama automatically calculates the correct date based on your Mac's internal clock.—**Joseph Schorr**

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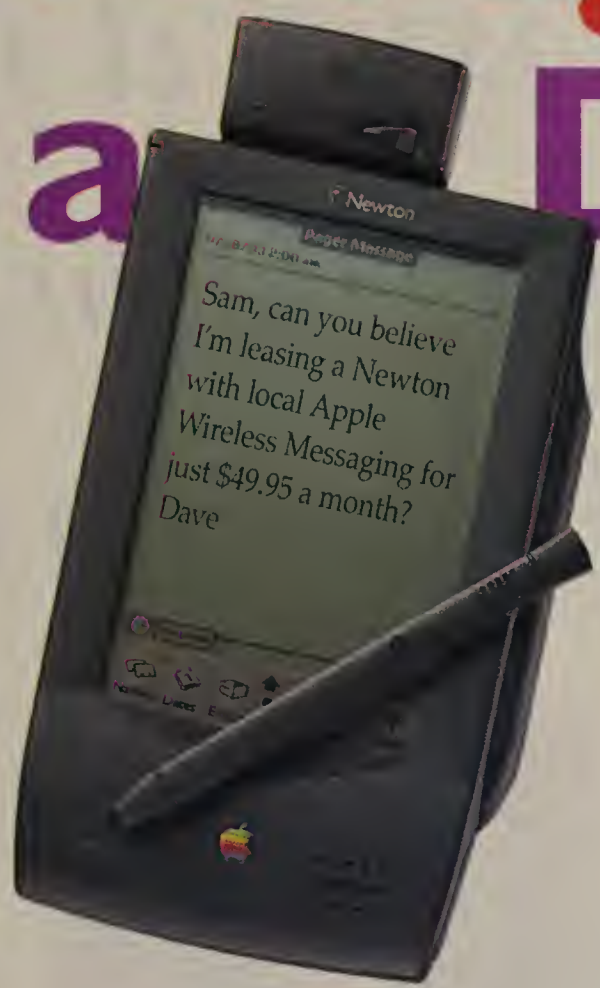

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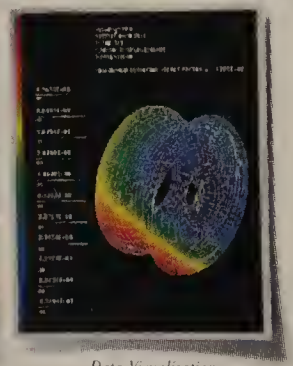
Tabloid Layouts

Business Graphics



Data Visualization

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BY LON POOLE

Quick Tips

Tips, Tricks, and Shortcuts

ACCORDING TO THE LAW OF AVERAGES, every so often a perfect Mac rolls off Apple's highly automated assembly line. Every trace is soldered perfectly. Every chip is the best of its batch. This ultra Mac, literally 1 in 10,000, is capable of vastly greater performance than a run-of-the-mill Mac. About four years ago Apple considered testing for these ultra Macs at the factory, putting them in special dark gray cases, and selling them at a premium as a separate Macintosh Pro line. As part of the evaluation process, a special activation sequence was added to System 7's Finder, then under development. The Mac Pro line never saw daylight, but Apple did use the dark gray color for its PowerBooks.

Statistically, there are probably about 2000 Mac Pros out there. The aforementioned activation sequence was never removed from the System 7 Finder. To see if you have a Mac Pro, bring up the About This Macintosh window. In the upper part of the window between the title bar and the divider bar, where the type of Mac is reported, click each of the four corners starting in the upper left and proceeding clockwise. Then press option-P-R-O. If you do in fact have one of these special Macs, the Mac icon will immediately turn dark and the word *Pro* will be added to the end of the Macintosh model name. Best of all, your Mac will now operate four times as fast!

If you're not one of the fortunate few blessed with a Mac Pro, sorry. Can I interest you in computer vitamins (eensy-weensy pills you pop into the floppy disk slot to double performance)? No? How about an ADB booster that triples your typing and mousing speed? A SCSI workout video that improves hard drive access time (but only if you run it for half an hour three times a week)? Somebody stop this April fool, please!

Invisible Barrier

If you secure your System Folder from prying eyes and meddling hands by making it invisible with ResEdit or other utility software, don't worry about someone using an alias as a backdoor entrance (as mentioned in a tip last December). Aliases cannot work through invisible folders, reports Scott Krajewski of Minneapolis. He also notes that an invisible System Folder makes the contents of the Apple menu disappear in System 7 (but not in System 6). These side effects of folder invisibility may not happen for a minute or so (that's how last December's tip passed the scrutiny of the tip-surveillance squad).

How to Share Files

Q. How can I link my two Macs so that from one I may access files that reside on the other without carrying the files on floppy disks? Apple's help line and user group members all tell me it's easy but don't say how to do it.

Norm Ennis
Lake Mary, Florida

A. First you must connect your Macs and your printer in a local area network (LAN). Then you can access shared printers with the Chooser and share files with standard System 7 commands, control panels, and the Chooser. The most economical type of network, and one that all Macs and network printers can connect to, is a LocalTalk network.

To establish a LocalTalk network you simply plug a network connector box into the printer port of each Mac and into the LocalTalk port of each network printer or other network device (such as a network modem), and run wires between the boxes. Farallon's PhoneNet connector boxes with two modular phone jacks (Farallon part PN308 or equivalent) are the most common. You link them with ordinary telephone cables, the kind used to connect a telephone to a modular wall socket. Be sure to use four-conductor cable, not two-conductor (look for four metal conductors on the RJ-11 modular plugs). In many homes and small businesses you can use the existing telephone cables and jacks in the walls to extend your network from room to room. With the four-wire cable common in homes, for example, the telephone uses the red and green wires and the network uses the yellow and black wires.

For networking only two devices—for example, two Macs or one Mac and one printer—you can save money by using Farallon's one-jack StarConnectors (part PN301). You can always add devices to this minimal network with one two-jack connector box per added device.

Some Macs and printers can use Ethernet connector boxes and wiring to

continues

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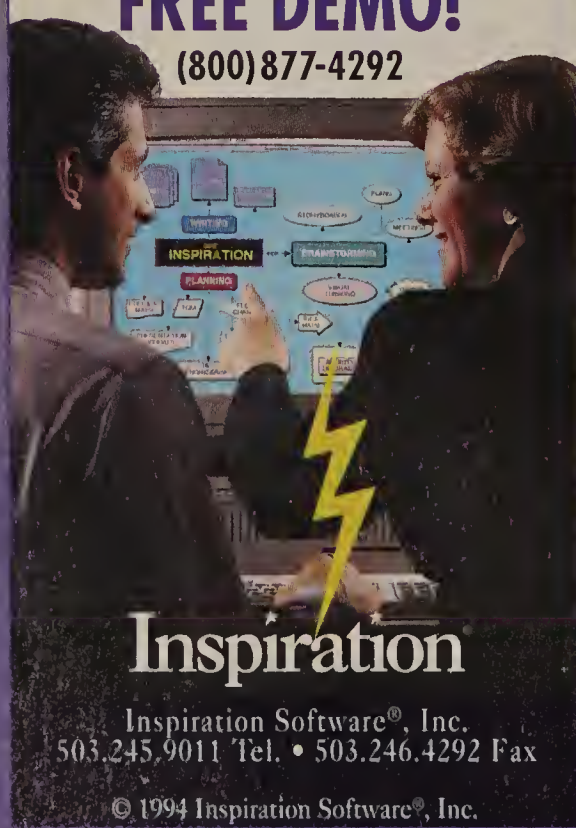

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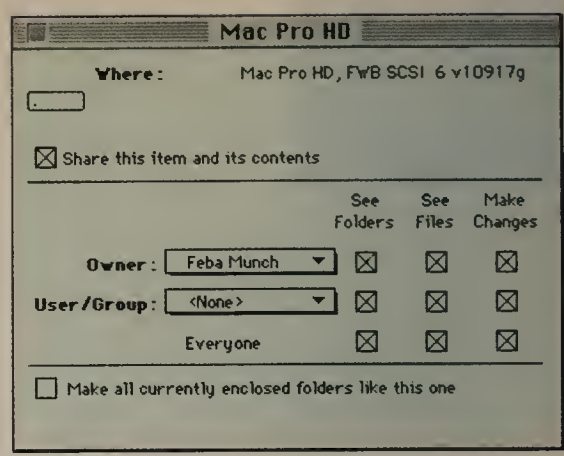
establish an EtherTalk network. Ethernet parts cost more than PhoneNet parts, but an EtherTalk network lets more people use the network concurrently without bogging down and is faster than a LocalTalk network.

Besides wiring the network, you must install System 7 (any version) on each Mac. Technically a Mac with System 6 and AppleShare client software can access files on a Mac with System 7, but System 7 is easier to get (from software resellers or *The Apple Catalog*, 800/795-1000) and offers two-way file sharing.

I only have room here to describe file-sharing basics. For full details check Apple's System 7 manual or—cheap plug—my book *Macworld Guide to System 7.1*, second edition (IDG Books Worldwide, 1993). To share your files with other network users, open the Sharing Setup control panel and fill in the Network Identity section—the Owner Name (usually you), Owner Password, and Macintosh Name. Then click the Start button in the File Sharing section. The Start button becomes a Stop button when file sharing has started up; this takes a little while. Next select a folder or hard drive whose contents you want to share, and choose Sharing from the Finder's File menu to bring up the item's access-privileges window. Turn on the "Share this item and its contents" option (see "Access Privileges"). All Macs on the network can make files available for sharing in this manner.

To access shared files on another networked Mac, open your Chooser and click the AppleShare icon. The Chooser then displays the names of Macs whose folders and disks you can share. Double-click the one you want to access. A dialog box appears in which you identify yourself as a guest or registered user. Click OK. Another dialog box appears, listing the items you can share. Click to select one item or shift-click to select several items, then click OK. A shared-volume icon appears on your desktop for each item you selected, and you use the shared-volume icon like a disk.

To expedite accessing a shared item in the future, select its icon and make an alias of it. Double-clicking the alias allows you to access the original shared item across the network without having to go through the Chooser. (If you are connected as a registered user when you make the alias, you will have to enter your password whenever you open the alias.)



Access Privileges The Finder's Sharing command brings up a folder or disk's access-privileges window, in which you establish which users can access the shared item and what privileges they have. You can use these settings to give any network user full access to the shared item. To restrict access, you create registered users and groups of users with the Users & Groups control panel, and then you change settings in access privileges windows of shared items.

Why Rebuild the Desktop?

Q. Just what is the point to rebuilding the desktop? Does optimizing the hard drive serve the same purpose as rebuilding the desktop? Does System 7.1 keep the comments in the Get Info windows when you rebuild the desktop, or are the comments erased?

Jim Howard
Cypress, California

A. Rebuilding the desktop may recover wasted disk space, by reducing the size of the file or files the Finder uses to store the database of desktop information, and may improve performance, by simplifying the database. Rebuilding may also fix icons that have become generic and may make it possible to open documents that the Finder can no longer find even though you have the creator applications. But rebuilding erases all Get Info comments (at least in System 7.1.1 and earlier).

You can rebuild your hard drive by restarting your Mac and holding down the ⌘ and option keys until a dialog box asks if you want to rebuild the desktop on the hard drive. If you have multiple hard drives or multiple hard drive partitions, you are asked about rebuilding each in turn. To rebuild without restarting, quit all open programs and then press ⌘-option-esc, forcing the Finder to quit. Immediately hold down ⌘-option while the System automatically reopens the Finder, and because you are pressing the magic keys, you are asked about rebuilding the desktop.

To rebuild the desktop file on a floppy disk or removable hard disk, insert the disk and hold down ⌘-option until you're asked if you want to rebuild its desktop. Before rebuilding a floppy in System 7, make sure the floppy contains at least one file (even a 1K alias will do). Due to a minor bug, System 7 (versions 7.0 through 7.1.1) won't rebuild the desk-

continues

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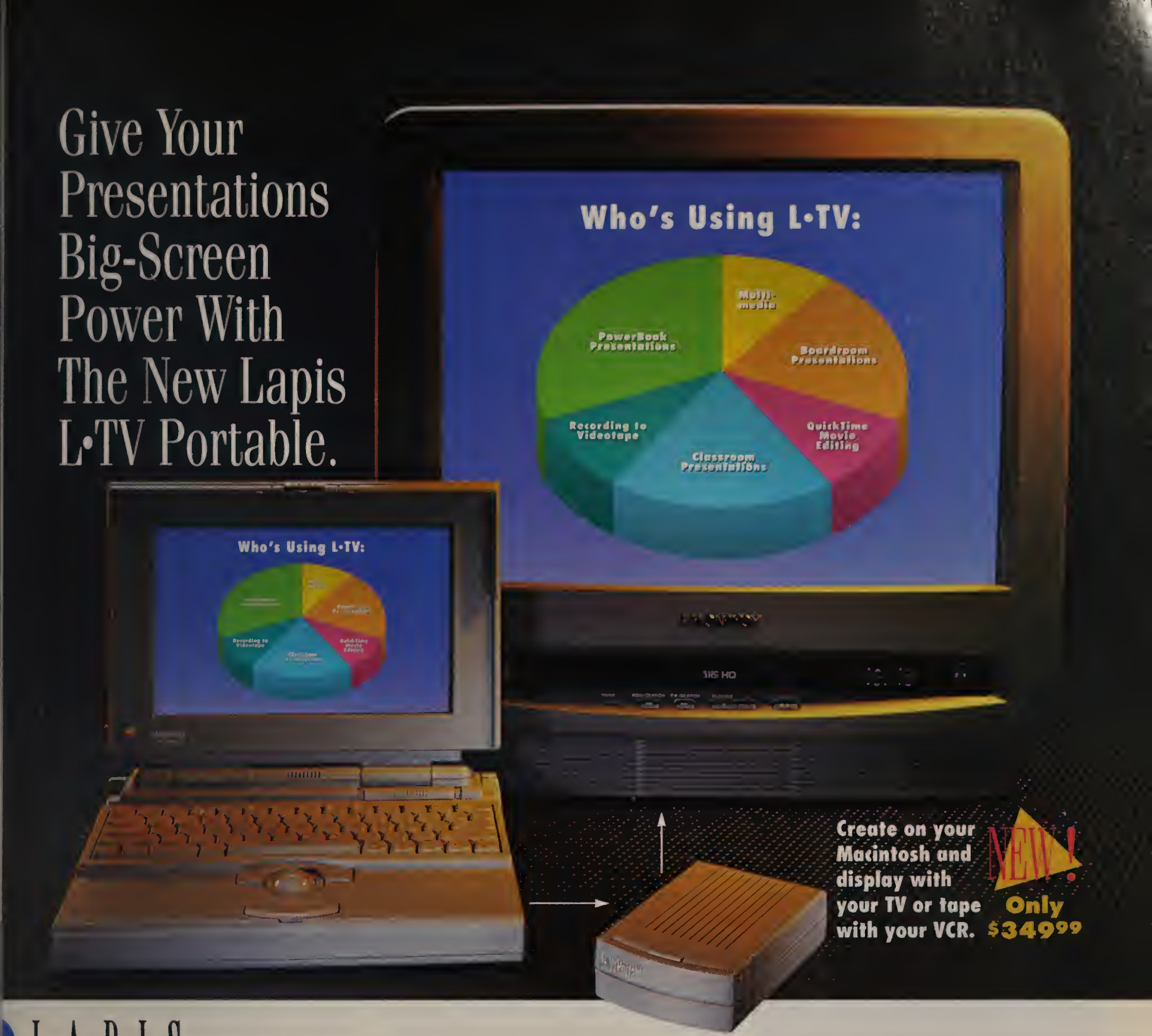

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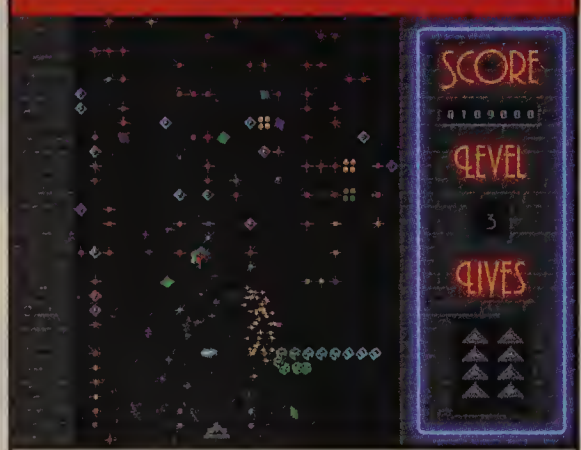

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top of a floppy from which you have deleted all files. By rebuilding the desktop of a floppy from which you have deleted many files over the course of time, you may recover truly useful amounts of disk space—more than 100K is not unusual. (Erasing a disk also rebuilds its desktop and is more efficient if the disk contains many files.)

Sometimes rebuilding a System 7 desktop does not fix generic icons or get rid of erroneous "application not found" messages—especially if the desktop files were corrupted before you began the rebuilding process. You can force the Finder to start rebuilding the desktop from scratch, which it does not normally do, by using the free application program Reset DTDBs 2.0 by Brian Gaeke or the free system extension Desktop Reset by Lloyd Chambers. Both programs are available from user groups and online information services.

You may not need to rebuild the entire desktop, which can take several minutes on a large disk, if you're only having trouble seeing the correct icons of one application and its documents in the Finder. You can use the free application Save A BNDL by Michael S. Engber to quickly restore the needed information from the application's BNDL resource to the invisible desktop files.

If rebuilding the desktop doesn't fix generic icons and solve document-opening problems, the fault could lie in the application's resources (an inconsistent BNDL resource or an incorrectly set bundle bit) or in a disk's invisible catalog file (also known as a directory file). Both types of problems can usually be fixed by disk-repair programs such as Symantec's Norton Utilities for Macintosh.

Moreover, rebuilding may not fix generic icons appearing on multiple partitions of a hard drive (where each partition has its own volume icon on the desktop), according to Kirk Kerekes of Tulsa. This can happen if the start-up volume contains aliases of applications on other volumes. The Finder tries to get the icons for the aliases from the original applications before mounting the volumes containing the originals. After failing to find the originals, the Finder substitutes generic icons for the aliases and for some reason fails to change the generic alias icons after mounting the volumes containing the original applications. To fix the problem, Kerekes wrote the $25 system extension FixIcons, which you can get from PaperClip Products (918/749-7417 or 800/497-5508).

Optimizing a disk does not rebuild its desktop database, although some utility programs can do both chores. Optimizing reorganizes all files so that they occupy contiguous blocks of disk space instead of scattered blocks. A disk drive can read a contiguous file more quickly than a fragmented file, though the difference is not dramatic unless the whole disk is badly fragmented.

IMAGE FROM CLIPTIME VOLUME II, AMERICAN MEDIA, ALPHA TECHNOLOGIES GROUP

Click Preview Off If you do not activate the Preview option of Photoshop's Brightness/Contrast command (and other commands in the Map and Adjust submenus of Photoshop's Image menu), Photoshop uses a method called color table animation to change the whole display in response to your adjustments (top). Photoshop instantly reverts to the unadjusted settings (by suspending color table animation) when you click anywhere in the dialog box's drag bar (bottom).

No PostScript Fonts

Q. Whenever I print a document containing PostScript fonts not built into my LaserJet 4M, the Mac sends the bitmapped version of the font instead of the PostScript font. I have System 7.1, and all of my PostScript fonts are in the Fonts folder. What should I do?

Chad Milios
Toledo, Ohio

A. Upgrade your printer-driver software to level 2 version 8.0 or later (free from Hewlett-Packard's distribution center, 303/353-7650). The HP level 2 driver is based on the LaserWriter 8 driver codeveloped by Apple and Adobe. The level 1 version 2.2 driver also works with System 7.1 but HP is no longer distributing it, and earlier versions do not know to look in the Fonts folder. Instead of upgrading, you can move your PostScript fonts to the Extensions folder or the System Folder, where your older printer driver can find them.

Talk in Your Earphone

TIP If you have no microphone for your Mac, try plugging the headphones from a portable tape recorder into your Mac's microphone jack and recording your voice with the Sound control panel. Headphones have a similar technology to microphones, but in reverse. My compact Sony earplugs worked just great from day one.

Abhijeet Bhadra
Union City, California

Quick Preview On-Off

TIP In Adobe Photoshop, I often adjust the brightness and contrast of an image. I could use Photoshop's Preview option to evaluate changes before making them permanent, but I find it hard to compare the displayed preview of the adjusted image with a mental snapshot of the original image. I prefer not to use the Preview option, instead letting Photoshop display my brightness and contrast changes in real time throughout the entire screen. To see the unchanged image instantly, I click anywhere in the drag bar at the top of the Brightness/Contrast dialog box (see "Click Preview Off"). As long as I hold down the mouse button in the drag bar, I see the unchanged image. Sometimes I even click several times in succession to quickly compare the image with and without changes. This technique also works with other commands—such as Color Balance and Hue/Saturation—whose dialog boxes have a Preview option.

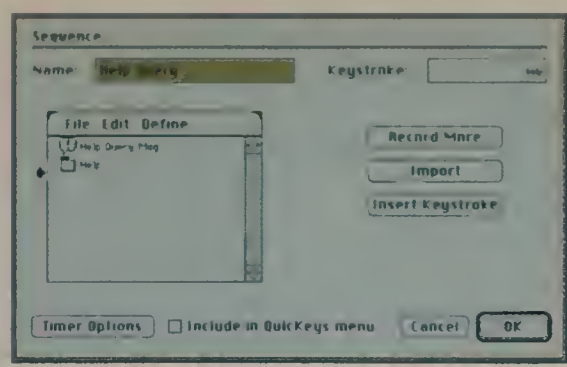
Jeffrey A. Hamman
Kennett Square, Pennsylvania

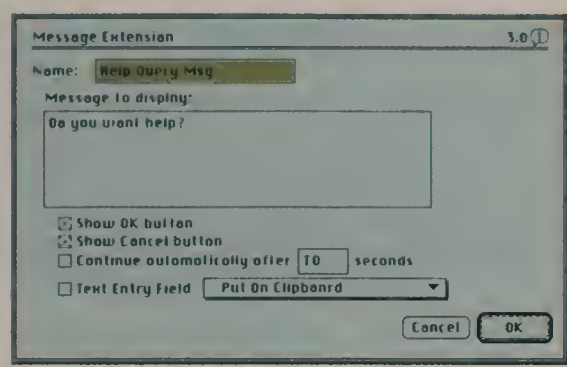
Photoshop 2.5's Variations command (in the Adjust submenu of the Image menu) lets you change contrast, hue (C,M,Y,K), and saturation, as well as lighten and darken a thumbnail of your image, while displaying a thumbnail of the original image alongside the altered one.—L.P.

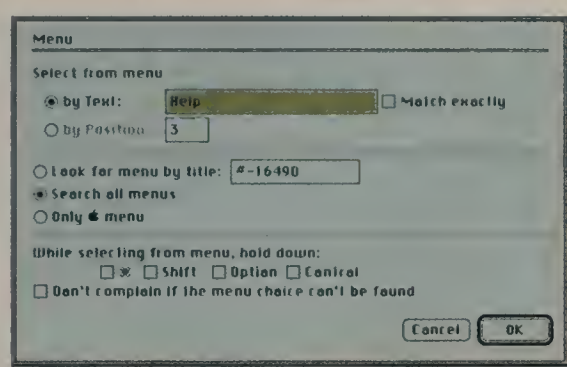
Making Help Optional

TIP The unfortunate souls who inadvertently hit the help key on an extended keyboard—when they had meant to press the delete key instead—have to wait for the Help window to open before closing it and getting back to work. Many people suggest using QuicKeys to disable the help key, but "Help Wanted or Not" shows a more elegant QuicKeys solution for those who sometimes do need help.

Brad C. West
Jeddah, Saudi Arabia



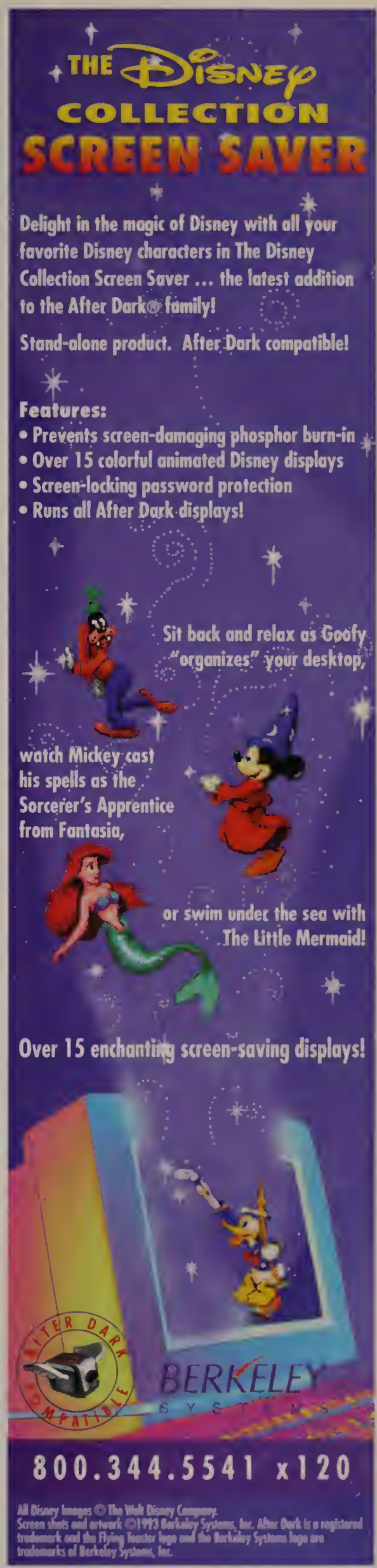


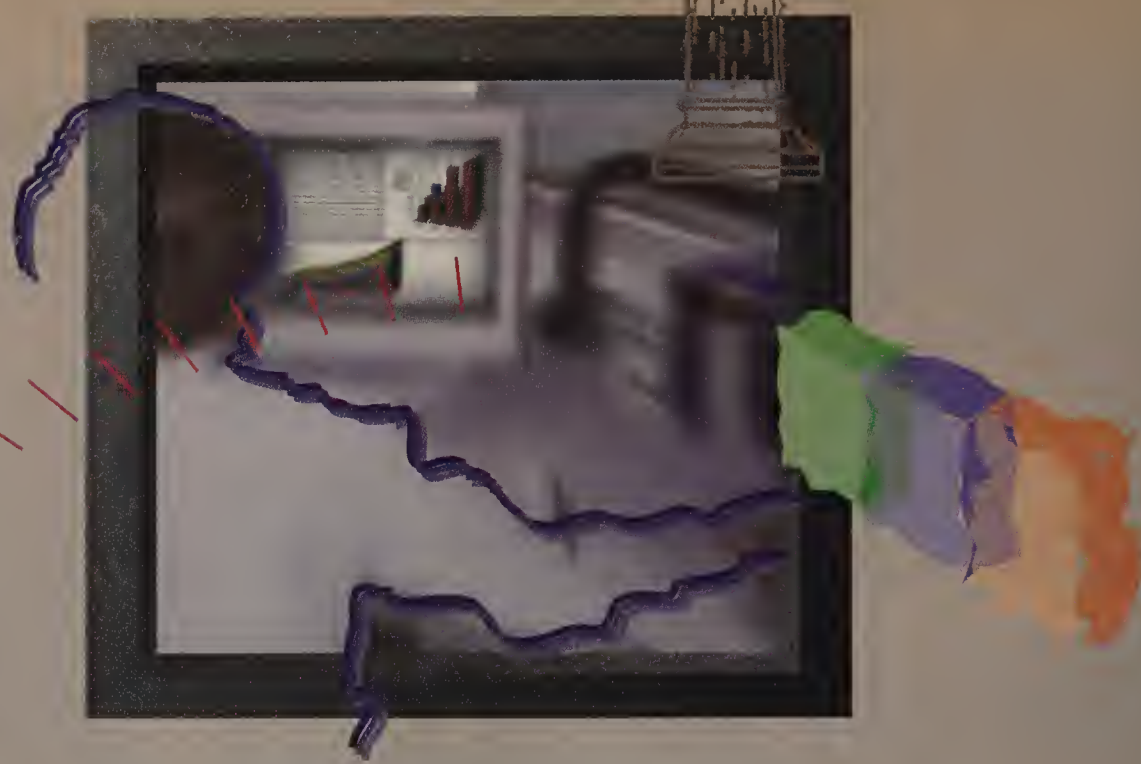


Help Wanted or Not This two-step QuicKeys sequence gives you the choice of getting help or not when you press the help key, in case you press it by accident (top). First a message-extension step asks if you want help and shows OK and Cancel buttons for your response (middle). If you click Cancel or press ⌘-period (.), the sequence ends. If you click OK or press return, a menu-selection step looks in all menus for a command whose name contains the word *Help* (bottom).

We pay from $25 to $100 for tips published here. Send questions or tips on how to use Mac computers, peripherals, or software (by mail or electronically) to *Quick Tips*, Lon Poole, at the address listed in *How to Contact Macworld* at the front of the magazine (include your address and phone number). All published submissions become the property of *Macworld*. Due to the high volume of mail received, we're unable to provide personal responses. m

LON POOLE answers readers' questions and selects reader-submitted tips for this monthly column. His latest book is *Macworld Guide to System 7.1*, second edition (IDG Books Worldwide, 1993).





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10 ☐ Government
11 ☐ Health Services
12 ☐ Higher Education
13 ☐ K-12 Education
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17. ☐ Marketing/Sales/PR/Communications
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26 ☐ Marketing/Sales
27. ☐ Educator
28. ☐ Art Director/Graphics
29. ☐ Editor/Writer
30. ☐ R&D
31. ☐ Student
32. ☐ Other

SIZE OF YOUR ORGANIZATION
Number of employees national and international. *Choose one only*

33 ☐ Under 50
34 ☐ 50-99
35 ☐ 100-499
36. ☐ 00-999
37 ☐ 1,000 & over

WHICH PERSONAL COMPUTER(S) DO YOU OWN/USE?
Choose all appropriate

38 ☐ Apple Workgroup Servers, Mac Quadra Series, Mac Centris Series, Mac II Series
39 ☐ Mac Performa Series
40 ☐ Mac LC Series
41 ☐ Mac PowerBook Series, Duo Series
42 ☐ IBM PC (or compatible)
43 ☐ None
44 ☐ Other ___

AT WHICH HOTEL ARE YOU STAYING?

45 ☐ ___

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[illegible] MACWORLD Expo, P.O. Box 4010, Dedham, MA 02027. Send overnight packages to: 260 [illegible] Street, Dedham, MA 02026

May 10-12, 1994, Washington, DC

The conference program at the MACWORLD Expo Summit features a different kind of program than you'll find at MACWORLD Expos in San Francisco or Boston.

Its focus will be on:

SUCCESS STORIES/CASE STUDIES — so you can see how your counterparts in other organizations are using Macintosh technology to solve the top-rated problems of limited budgets, reduced staff, interoperability, and procurement restrictions.

ISSUES AND ANSWERS, on topics of special importance to Macintosh and Windows users in the Washington community.

Each session at the Summit will run 80 minutes: 50 minutes worth of fact-filled presentations, with the remaining 30 minutes devoted to extensive interaction with the Summit Conference Faculty and members of the audience.

And to maximize your time with the leading-edge users and analysts that comprise our Summit Conference Faculty, MACWORLD Expo will host a special Free Exchange Room at the Washington Convention Center, where you may — at any time during the show — meet informally with speakers for continued discussion.

In addition to keynote sessions that paint an insightful picture of the role of the Macintosh in the National Information Infrastructure, you can create your own agenda from twelve separate conference tracks. Here is a preview of the sessions you can expect at the MACWORLD Expo Summit:

1 TRACK

THE MAC AS A PRODUCTIVITY TOOL. Whether you're o Macintosh power user or o skeptic who thinks the Mac is useful only for grophics opplicotions, in this trock you'll hear from users who have found broad-bosed solutions to heighten their productivity ond slash their operating costs. Included here will be: • Business Process Re-Engineering • Training • Kiosks • Teleconferencing • Forms Monogement • Desktop Presentations • Desktop Publishing • ond more.

2 TRACK

OVERCOMING PROCUREMENT PROBLEMS. Both for vendors who want to sell to the government, os well as for government users who want to buy from industry. Among the topics offered: • Understanding Procurement Regulations • Maximizing Sales in the Federal Marketplace • Competitive Procurement for Macs ond PowerPCs • Site License Management • Specificotions vs. Sole Source • End-User Case Studies: How I Procured Moc Products

3 TRACK

GOVERNMENT USER CONCERNS. Burning issues to be discussed — ond solutions shored — of particular importance to computer users in the government sector. • Encryption • Electronic Doto Interchonge • Key Government Bulletin Boards • Multilevel Processing • Building a Moc That Meets Classified Requirements • Voice/Dato/Video/Imaging Tronsmissions between Agencies

4 TRACK

ELECTRONIC PUBLISHING WITH THE MAC. How users are drosticolly reducing the cost of printing, distributing, and storing informotion — as well as dramatically increasing the power of odvertising and sales presentotions (from catologs to kiosks), records monogement and archiving, technical product support and documentation, ond training customers and employees. • Latest Developments in CD-ROM • Beginner's Guide to Publishing o CD-ROM Disc • Creation, Authoring, ond Development Tools • Dotobases on CD • Text Search and Retrievol • Maximizing Adobe Acrobot

5 TRACK

THE POWERPC. Leading experts will discuss what new things you'll be able to accomplish with the dromatic performance boost ovailable with the first RISC-based Mocintoshes. • What PowerPC Delivers • PowerPC Performonce Issues • How Competitive is PowerPC? • PowerPC as the Ultimote Computer Platform

6 TRACK

INTEROPERABILITY. Avoiding the pitfalls into which others have stumbled, by getting first-hond reports of what worked and what didn't. • Client/Server • AOCE • High-speed Computer Networks • TCP/IP • Mac/UNIX • Mac/Windows • Mac to Host • Mac/VAX • Open Systems • Downsizing

7 TRACK

MACINTOSH NETWORKING. How users are maximizing the efficiency of their Macintosh networks, plus insights on what lies ahead in Macintosh connectivity. • AppleTalk • Essentiol Network Management Tools • Wide-Area Networks with Total Connectivity • LocalTalk and Ethernets • ARA • Communicating between Newtons and Macs

8 TRACK

ENTERPRISE COMPUTING. How users are providing the right informotion, to the right person, at the right time, to moke the best decision. • Mobile Computing • Wireless Nets • EIS/DSS • Mac Servers • NT on PowerPC • Moximizing the Internet • Gatewoys to Other Mail Systems

9 TRACK

THE MAC IN SCIENCE/RESEARCH/ENGINEERING. Success stories on the Moc as a critical research tool, in scientific opplications, in management of technicol data, its role in the loborotory, ond other outstanding exomples.

10 TRACK

THE MAC FOR THE SMALL OFFICE/HOME OFFICE. How Mocintosh users in home offices and small businesses are copitalizing on low-cost and no-cost programs and procedures, olong with their fovorite utilities, shortcuts, and disaster-ovoidonce strotegies.

11 TRACK

EMPOWERING TECHNOLOGIES. From Apple's consumer electronics products to its breothtaking sources of expanded computer power, users share their experiences with: • Newton MessagePad • PowerBook • Multimedio Mocs • Digital Photography • Digital Video • Digital Imaging • Videoconferencing

12 TRACK

APPLICATION WORKSHOPS. Both for Macintosh beginners and veterons: intensive training sessions by the award-winning staff of MacAcodemy. • Cloris FileMoker Pro • Microsoft Word • Aldus PageMoker • Microsoft Excel • Mocintosh Networking • Beginning Mocintosh • Advanced Mocintosh

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Days Inn Downtown 1201 K Street, NW Washington, DC 20005	Days Inn Downtown	$105/110	(202)842-1020
DuPont Plaza Hotel 1500 New Hampshire Ave., NW Washington, DC 20036	DuPont Plaza Hotel	$115/135	(202)483-6000
Grand Hyatt Washington, DC 1000 H Street, NW Washington, DC 20001	Grand Hyatt Washington, DC	$189/214	(202)637-4760
Henly Park Hotel 926 Massachusetts Ave., NW Washington, DC 20001	Henly Park Hotel	$150/170	(202)638-5200
Holiday Inn Crowne Plaza 775 12th Street, NW Washington, DC 20005	Holiday Inn Crowne Plaza	$155/175	(202)737-2200
JW Marriott 1331 Pennsylvania Ave., NW Washington, DC 20004	JW Marriott	$157/167	(202)393-2000
Vista International Washington 1400 M Street, NW Washington, DC 20005	Vista International Washington	$145/165	(202)429-1700
Washington D.C. Renaissance Hotel 999 9th Street, NW Washington, DC 20001-9000	Washington D.C. Renaissance Hotel	$149/169	(202)898-9000

HOTEL ACCOMMODATIONS

Special hotel rates have been negotiated for MACWORLD Expo Summit participants at select Washington, D.C. hotels. Call your choice of hotel directly by April 8th to make reservations and for the best selection. A limited number of rooms have been reserved at preferred rates. Be sure to mention MACWORLD Expo Summit to qualify for these rates.

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American Airlines and USAir are offering 5-10% off most fares to MACWORLD Expo Summit attendees. Simply call the airlines at the numbers below and be sure to mention MACWORLD Expo Summit's file number. Certain rules and restrictions may apply.

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MACWORLD EXPO SUMMIT

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Interoperability

GATEWAYS

PRODUCTION WORKSHOPS

EDITED BY ELIZABETH DOUGHERTY

Networks

THE LATEST IN CONNECTIVITY AND COMMUNICATIONS

Apple Speeds Servers and Software

IF ACTIONS SPEAK LOUDER THAN words, then Apple is practically bellowing this message: Macintosh networks can't exist without good servers. A year after introducing its Apple Workgroup Server (AWS) bundles with improved AppleShare software, the company has added two configurations to its high-end AWS 95 and tuned AppleShare Pro to run faster.

Starting in mid-February, the AWS 95 will ship in two new configurations: one for file-and-print service, the other for database service, both about $11,795. Both servers will come with a new, internal 2GB hard drive with a seek time 4 milliseconds faster than that of the 1GB drive that had been the largest shipped with the AWS 95. The new configurations also offer a redesigned internal rack and SCSI cable that let you mount up to five hard drives in addition to the DAT drive that ships with both units.

The file and print version of the AWS 95 ships with AppleShare Pro 1.1 and A/UX 3.1 installed on the internal 2GB hard drive, a DAT drive with Retrospect Remote A/UX backup software, 32MB of main memory, and a 256K second-level memory cache.

The relational database configuration comes with 48MB of main memory, a 512K second-level cache, a 250MB hard drive with A/UX 3.1 installed, a 2GB hard drive (for database storage), and a DAT drive with Retrospect Remote A/UX.

Some of the most popular—and until recently, most neglected—file-and-print-server software for personal computers, the AppleShare line, last year was graced with two new versions: AppleShare Pro (which runs on A/UX) and AppleShare 4.0 (which runs on System 7 but requires a fast 68040 processor).

To improve Pro's performance, Apple tuned up not only the file-and-print software, but also the underlying A/UX system software. The company claims that under the improved A/UX 3.1 ($795 for one user), AppleShare Pro 1.1 ($2399) performs sequential reads from a hard drive about 40 percent faster, performs sequential writes about 70 percent faster, and lets users browse files and directories on the server an amazing 123 percent faster. Like the other new products, it's scheduled to ship in mid-February. Registered users who bought the AWS 95 with AppleShare Pro since December 1993 will receive the software update free. Other registered users can order the upgrade directly from Apple for $199.

For more information about getting an update or about the new configurations, call Apple's network-information hotline at 408/862-3385.—MARGIE WYLIE

DAVID KAHL

Tools to Grab Mainframe Data

LIKE SOLDIERS STRANDED BEHIND enemy lines, Mac workgroups have long been cut off from business data and applications housed on their companies' mainframes or PC LANs. Coming to the rescue of isolated Macintosh users, powerful new client-server development tools from Forte Software and Uniface Corporation can give all users equal access to enterprise data, regardless of the desktop system, server platform, or user location.

Due this summer, Forte's development environment will feature a unique approach to application partitioning: a developer first defines an application log-

ically, and then Forte decides how to partition the application. Forte, whose price had not been set at press time, will support Mac, Windows, and Motif environments; UNIX, VMS, and NT servers; Oracle, Sybase, and Rdb database-management systems; and TCP/IP, DECnet, Novell, and AppleTalk networks.

Uniface, which already offers a Windows, OS/2, and Motif version of its development environment, plans to ship Uniface for the Macintosh in the first quarter of 1994. It will use a central model repository that lets developers define an application's logic at a high level of abstraction so that the application can easily be modified or scaled to greater complexity throughout its life cycle. Uniface for the Mac will support MacTCP and DECnet networks and Oracle and Sybase database-management systems. A single development license will cost $4400.

Both products support VITAL (Virtually Integrated Technical Architecture Lifestyle), guidelines developed by Apple to help corporate customers design information systems in enterprise networks. Forte Software, 510/869-3400; Uniface, 510/748-6145.—MARTHA STRIZICH

Making ARA 2.0 Secure

APPLE REMOTE ACCESS SECURITY used to be an afterthought, but several companies have stepped on stage with serious security products that plug into ARA 2.0.

From Security Dynamics (617/547-7820), the $50 SecurID Card displays a randomly generated access code that changes every 60 seconds. To access the network, users must type in the current code from the card plus their own ID number. The company's ACE/Server software ($1950) authenticates the user's identity and manages security across networks that can include Sun, IBM, DEC, and HP machines. ARA client software lists for $150 per server.

The Digital Pathways (415/964-0707) system uses the token method of security, in which the client must correctly read and return a randomly generated and DES-encrypted string received from the security hardware. The Defender hardware ($500 to $750) sits between a modem and its server and requires the company's SecureNet Key software for the Macintosh on the client side ($50).

MicroFrame (908/494-4440) also uses token-based security in conjunction with hardware units on the server side. The company's SofKeyPlus Macintosh client can be used with any products from its Network Security Systems hardware line. Costs range from $500 for 100 users to $10,000 for as many as 20,000 users.

Finally, OSCG (206/883-8721) offers client software ($95) that provides access to servers that require Kerberos version 5 password authentication integrated into Apple Remote Access.—CAMERON CROTTY

Dial-In Server Answers Macs, PCs

BOTH MAC AND PC USERS CAN DIAL into a network through Asanté Technologies' NetConnect-Remote Access Server (RAS).

Supporting both IPX and Apple Remote Access Protocol 2.0, NetConnect-RAS lets up to 16 simultaneous dial-in users access their networks as if they were attached to the network locally. Macintosh users need the Apple Remote Access client ($69); a PC client ships free with the server.

NetConnect-RAS with 8 serial ports (for connecting modems or a CSU/DSU, when using dedicated 56-Kbps telephone lines) costs $3899; an 8-port expansion kit costs $2175; the 16-port unit costs $5875. Asanté, 408/662-9686 or 408/435-8388. —MARGIE WYLIE

RICHARD RETHEMEYER

Asanté Technologies' NetConnect-Remote Access Server lets up to 16 Macintosh or PC users dial in at once to access the network.

IN BRIEF

■ **AppleShare Update** AppleShare 4.0.1 ($1899 for 150 users) runs on 68040 machines that don't include a floating-point unit, such as the Quadra 605. It also squashes a few bugs, including solving some compatibility problems with Farallon's popular PhoneNet Ethernet cards. AppleShare 4.0.1 can also share a server with Apple's new MultiPort Apple Remote Access Server and the latest version of the Internet Router (3.0.1). Update via AppleLink or order disks from Apple for a nominal materials and shipping fee (around $10). 408/862-3385.

■ **Servers Join ARA 2.0 Parade** Many new models from dial-in server vendors will support the new version of the Apple Remote Access protocol. APT Communications (301/831-1182), Cayman Systems (617/494-1999), Shiva (617/270-8300), Xylogics (617/272-8140), and Webster Computer (408/954-8054) have all announced that their dial-in servers will support ARA 2.0 in the first half of 1994.

■ **Network Troubleshooting Tapes** Now that you have a protocol analyzer, what do you do with it? AG Group, the maker of EtherPeek, LocalPeek, and TokenPeek protocol analyzers, tries to answer that question with its four-tape TroubleShooting Videotape Series ($275; also sold separately). Two of the tapes cover AG Group products exclusively, but the other two ($99 each) come with troubleshooting books. One book covers basic Ethernet troubleshooting; the other covers beginning AppleTalk protocol analysis. AG Group, 510/937-7900.

At Ease Security Bug Fixed

AN UPGRADE TO AT EASE 2.0 FOR Workgroups, Apple's simplified interface for Macs on local area networks, closes a security loophole in the original release. Version 2.0.1 corrects a bug that allows users in a server-based environment to bypass At Ease and gain direct access to the Macintosh Finder. The problem does not affect peer-to-peer LANs.

The update is available free of charge on AppleLink; Internet; and commercial information services such as America Online, CompuServe, GEnie, Resource Central, and ZiffNet. Apple Computer, 408/996-1010.—MARTHA STRIZICH

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Linking AppleTalk Workgroups over TCP/IP

by JOEL SNYDER

USE THESE TECHNIQUES TO TUNNEL YOUR WAY TO WANS

Whether you need to connect a small office in Cincinnati with one in Seattle, or you have salespeople scattered all over the United States and want to connect them to the same wide-area network, the answer may be right in your own proverbial backyard: a TCP/IP network.

But to connect your AppleTalk LANs over the sometimes hostile middle ground of a TCP/IP network, you have to go underground using a method called tunneling.

AppleTalk and TCP/IP can share an Ethernet network; but like cars and trucks sharing a highway, they don't always mix well. In fact, many administrators ban AppleTalk from their TCP/IP networks. The chatty broadcast protocol wastes bandwidth. Plus, running yet another protocol on the same backbone complicates administration.

ROB DUDLEY

Tunneling lets routers send packets from one AppleTalk workgroup to another through an existing TCP/IP network (or backbone). In AppleTalk tunneling, two routers—one at either end of a TCP/IP network—build a passage through which "foreign" AppleTalk network packets can pass. Then the routers use that tunnel just as they would use a telephone line to connect two remote sites. Effectively, the routers hide AppleTalk packets inside TCP/IP packets. The TCP/IP network doesn't know anything about AppleTalk; it doesn't need to. All it knows is that there's a TCP/IP connection between two systems on the network, and it unwittingly moves the disguised AppleTalk traffic as though it were native TCP/IP traffic.

THE TCP/IP NET DOESN'T NEED TO KNOW ANYTHING ABOUT MACS

Tunneling is simple in theory—connect AppleTalk routers that offer TCP/IP tunneling to the networks in question, and the LANs' Choosers blossom with new zones. In practice, it's a little more complex. Tunneling isn't always the best solution. While tunneling can be convenient for AppleTalk users, it's a security risk for the TCP/IP administrator, who can't control what sort or volume of traffic is passing through the tunnel (see "Good Tunneling, Bad Tunneling"). Sometimes no TCP/IP backbone is available. Even if you decide tunneling is for you, you have to choose a tun-

HITCH A RIDE ON THE INFORMATION SUPERHIGHWAY

There are 14,000 local area networks attached to the Internet, and one of them may be yours. Including almost 2 million computers, the Internet has become the largest computer network in the world.

The Internet probably isn't your first choice as a way to link Macintosh AppleTalk LANs, but it could be. If the politics, finances, and technology all fit, the Internet can be an excellent way to bring together AppleTalk LANs.

Choosing whether or not to use the Internet involves more than just comparing cost, but money is a deciding factor.

In general, if you have only two sites to connect, the Internet is not a very cost-effective option. Connecting one workgroup to the Internet with reasonable speed (at least 56 Kbps) costs between $1000 and $2000 per month for most companies in major metropolitan areas. If you have two sites to connect, each needing its own Internet link, that's $2000 to $4000. Compare that with about $1000 per month for a coast-to-coast 56-Kbps leased line, and the Internet isn't a very attractive alternative.

However, when you have many sites, the Internet becomes more affordable. To build a mesh network (every site connected to every other site) for six sites using leased telephone lines, you have to order, install, manage, and pay for 15 leased lines, plus big routers at each site. Use the Internet to create a mesh network, and you need only 6 lines and smaller, less expensive routers to connect each site to the Internet. At that point, whether or not you use the wealth of other services available on the Internet (like online information services, databases, and worldwide E-mail), the Internet is a better deal.

Also, the roots and core of the Internet come from university projects funded by the U.S. government, which imposes acceptable-use policies that dictate what kind of traffic can pass over which parts of the Internet. These policies vary from network to network within the Internet. Network traffic in direct support of research and education is permitted everywhere on the Internet. Business traffic, however, is restricted. The massive North American NSFnet backbone does not permit commercial traffic. CIX, the Commercial Internet Exchange, is a trade association that links commercial Internet service providers. CIX member networks can pass data across the CIX backbone without restrictions. That means that a company connected to one CIX member can use its Internet connection for entirely commercial purposes—such as tunneling AppleTalk networks—provided it is communicating with another CIX member. You buy the connection time through a CIX provider and trust it to route your traffic over commercial lines only.

Seven regional Internet access providers and four major national Internet providers are all members of CIX, along with smaller networks in the United States, Europe, and Asia. (See the table at right a for list of CIX member networks and how to contact them.)

CIX isn't the only answer for commercial use. If your traffic is restricted to a single region, a non-CIX regional network in your area may work for you. Just be certain to check the net's use policies before signing up.

Because the Internet offers a worldwide TCP/IP backbone, tunneling through the Internet can bring AppleTalk connectivity to remote locations without requiring a major investment in leased lines.

North American CIX Networks

Regional Networks

BARRNet	415/725-1790	(California)
CERFNet	800/876-2373	(California)
JvNCnet	800/358-4437	(Northeast U.S.)
NEARnet	617/873-8730	(Northeast U.S.)
NorthWestNet	206/562-3000	(Northwest U.S.)
SURAnet	301/982-4600	(Southeast U.S.)
Westnet	303/491-7260	(Southwest U.S.)

U.S. Networks

AlterNet	703/204-8000
ANS CO+RE	800/456-8267
NETCOM	408/345-2600
PSINet	703/620-6651
Sprintlink	800/817-7755

Table courtesy of the CIX Association. For updates, contact CIX at 303/482-2150.

For information on other regional providers in your area, contact the InterNIC (Internet Network Information Center), a network-information clearinghouse funded by the National Science Foundation (a major sponsor of the Internet) at 800/444-4345.

neling method. While Apple and router vendors are working toward a single tunneling protocol, you have to pick from four different methods, three of which are incompatible with one another, if you want to tunnel today.

Tunneling Routers and Their Protocols

Company	Router	Tunnels Supported	Ports (LocalTalk/ Ethernet)	Price	Phone
Apple Computer	Apple Internet Router	AURP	2/6	$499	800/776-2333
Cayman Systems	Gatorbox EX	SEDI, TREDI	0/2	$3495	617/494-1999
	Gatorbox CS	SEDI, TREDI	1/1	$2795	617/494-1999
	GatorStar GX	SEDI, TREDI	24/1	$3895	617/494-1999
Cisco Systems	Cisco 2500	GRE, SEDI	2/1	$3295	415/903-8000, 800/553-6387
Compatible Systems	EtherRoute/TCP II	SEDI	2/1	$1895	303/444-9532
	RiscRouter 3000E	SEDI	2/2	$3495	303/444-9532
Farallon Computing	InterRoute/5	SEDI, AURP	4/1	$3499	510/814-5000
	StarRouter	SEDI, AURP	12/1	$3299	510/814-5000
Shiva Corporation	FastPath 5	TunnelTalk *	1/1	$1999	617/270-8300, 800/458-3550
	FastPath 5R	TunnelTalk *	1/1 2/2	$1999 $3799	617/270-8300, 800/458-3550

* *An implementation of the Dr. Pepper standard.*

SEDI: Simple, but a Road Hog

Cayman Systems introduced Cayman Tunnels in 1989, now known as SEDI (Simple Encapsulation of DDP in IP). Since it was the first tunneling protocol, SEDI has become by sheer weight of numbers the de facto standard for AppleTalk tunneling through TCP/IP. In addition to Cayman, other companies such as Farallon Computing and Compatible Systems make routers that use SEDI to tunnel (see "Tunneling Routers and Their Protocols").

SEDI is simple. Two routers connect by using TCP/IP. Using the connection as a dedicated circuit (which acts like a phone line), they put AppleTalk's DDP packets into TCP/IP's UDP packets. There's not much more to it. Linking two small AppleTalk networks using SEDI doesn't require much hardware or management. But SEDI doesn't work for large networks.

When Apple introduced AppleTalk, the enormous extended Ethernet LANs of today didn't exist. One of AppleTalk's goals was speed: speed in identifying new resources, and speed in discovering when a resource was disconnected or in some other way unavailable to the network.

AppleTalk's Routing Table Maintenance Protocol (RTMP) is the protocol that routers use to find new AppleTalk networks. Every 10 seconds, every AppleTalk router broadcasts its entire routing table in an RTMP packet. If a router isn't heard from at least once every 20 seconds, the other routers consider its network to be offline. For users, the nice part is that RTMP discovers new networks and routes quickly, and network problems show up fast—usually within 20 seconds. For managers of stable networks, though, RTMP is wasteful, transmitting the same information over and over again, every 10 seconds, around the clock.

That's not much traffic overhead for an AppleTalk network with only 10 routers. But when that number climbs to 100, as it easily does on a corporate network backbone, RTMP traffic consumes more than 25 percent of the Ethernet backbone's bandwidth. Even worse, RTMP packets eat up processing power, leaving no capacity for routers to perform the function for which they were purchased: TCP/IP routing.

Few people noticed this performance problem (although Apple has hinted at it for years) until wide-area links started popping up. The fastest typical TCP/IP WAN links operate at about 15 percent of the capacity of Ethernet's 10-Mbps bandwidth. (Typical WAN speeds are 9.6 Kbps, 56 Kbps, and 1.5 Mbps.) When bandwidth is that limited, it doesn't make much sense to keep broadcasting the same routing information. Cayman's original tunneling, SEDI, does nothing to reduce routing traffic. That's where AURP, Dr. Pepper, and TREDI come in.

Tunneling and More

AURP, the AppleTalk Update–based Routing Protocol, is Apple's answer to this problem, and many more. AURP performs a lot of other functions beyond simple tunneling and traffic reduction. AURP is a broad answer to the problem of building enormous multicompany AppleTalk networks that resemble the Internet itself, only based on AppleTalk instead of TCP/IP. AURP routers also provide basic security by selectively hiding devices and networks. AURP routers can also renumber AppleTalk networks, an important feature when building interorganizational networks, because it lets two AppleTalk networks link up without fear that there will be a numbering conflict. AURP even includes special handling for a so-called free-trade zone, which lets two or more organizations connect selected parts of their networks without compromising the rest of the networks' security.

Apple also sponsors a worldwide AppleTalk network based on AURP, which Apple uses as a proof of its concept that companies can link AppleTalk networks over the Internet easily and quickly using its AURP protocol.

However, currently only Apple and Farallon Computing support AURP. Other router companies have criticized the protocol as being too far-reaching for the simple needs of most tunneling.

AURP Alternatives

In reaction to the complexity of AURP, several hardware and software vendors have formed the AppleTalk Networking Forum (ANF), which initially advocated an alternative tunneling specification, dubbed Dr. Pepper.

The goals of Dr. Pepper are not as far-reaching as AURP's. In addition to tunneling, Dr. Pepper focuses mainly on reducing the number of RTMP routing packets that travel over a TCP/IP tunnel between two AppleTalk networks. In many business environments, the basic traffic-reduction and security features in Dr. Pepper are all that are needed.

The only vendor to ship a Dr. Pepper–compatible product is Shiva Corporation. TunnelTalk, Shiva's implementation of the Dr. Pepper specification, is available in Shiva's FastPath routers. Like AURP routers from Apple and Farallon, the FastPath with TunnelTalk connects AppleTalk networks over a TCP/IP backbone. Unlike AURP, TunnelTalk does not include network numbering or other AURP features specifically

GOOD TUNNELING, BAD TUNNELING

GOOD

- Tunneling lets you spread out AppleTalk across a corporate backbone gradually.
- It doesn't require running AppleTalk on the backbone.
- It offers better security for AppleTalk workgroups than usual AppleTalk WANs.
- Through the Internet's worldwide TCP/IP backbone, tunneling can connect remote locations without requiring a major investment in leased lines.

BAD

- You may have to buy expensive routers that can take the tunneling load or that use compatible tunneling methods.
- Encapsulating and unwrapping each AppleTalk packet can slow network performance.
- Tunnels can pose a security problem for TCP/IP administrators.
- AppleTalk tunnels take an administrator's time; plus, they require setup, management, and maintenance.

designed to support very large AppleTalk internets.

Cayman Systems, the oldest player in the AppleTalk tunneling game, has offered users a second tool for digging tunnels by proposing TREDI (Traffic Reduced Encapsulation of DDP in IP). TREDI is backward-compatible with SEDI, the tunneling scheme already used by many routers. If a TREDI router connects to a SEDI router, the TREDI router falls back to SEDI operation. That's good news for owners of SEDI routers. The bad news is that TREDI represents yet a third point of view on how to accomplish AppleTalk tunneling without generating so much traffic.

Cayman Systems now ships TREDI-compatible versions of its GatorBox and GatorStar routers.

On the other hand, Cisco Systems, a large and influential maker of routers for more than just Mac networks, uses yet a fourth AppleTalk-over-TCP/IP tunneling scheme, called GRE (Generic Route Encapsulation). GRE can encapsulate not only AppleTalk but many other protocols as well, such as NetWare's IPX, within a TCP/IP tunnel. Today only Cisco uses GRE. Yet because of its versatility, GRE makes up the basis for the AppleTalk Least-Common-Denominator Tunneling Protocol (ALTP), the supposedly final standard being considered by the ANF. (No router supported ALTP at press time.)

Finding a Network

Choosing a tunneling protocol is only half the solution to linking AppleTalk networks. Finding a network to tunnel through is the other half. Many organizations have corporate TCP/IP networks. Mac administrators don't always know about the existence of TCP/IP backbones in their companies because backbone administrators don't always understand how a Mac workgroup could use a TCP/IP network. (If you don't know whether your company has TCP/IP facilities, ask your MIS manager.)

While many organizations have TCP/IP backbones that stretch across campuses and even towns, your company's backbone may be much smaller or even nonexistent. For you, the Internet may be a workable alternative (see "Hitch a Ride on the Information Superhighway").

Which Approach?

You may not have the luxury of choosing the tunneling method that would work best for you. If all your installed routers use SEDI, then you're probably stuck with using the bandwidth-hungry protocol. Check with your backbone administrator before you load the network with the traffic generated by SEDI.

But if you have the freedom of buying or upgrading to routers that use a different routing method from SEDI, you really have three basic choices: go with SEDI, a proven but wasteful tunneling method; choose Apple's standard and get its other benefits; or use one of the alternative streamlined protocols.

For large interorganizational networks, AURP meets needs that Dr. Pepper and TREDI don't, but it isn't widely supported yet. If you have a lot of old routers, you may have to upgrade or even buy new routers.

If you are interested solely in tunneling, and you want to tunnel with as little impact on the host network as possible, then look to TREDI or Shiva's Dr. Pepper–based protocol, TunnelTalk. But if you need to connect only a couple of AppleTalk LANs, your network bandwidth isn't at a premium, or you aren't that particular about tunneling and would rather base a router-buying decision on other factors, all of these protocols offer the same basic benefit: they carry AppleTalk traffic in TCP/IP tunnels. Any tunneling protocol will work, so long as the routers at both ends of the tunnel use the same protocol. **m**

JOEL SNYDER is a senior analyst with Opus One, a Tucson, Arizona–based consulting firm. He specializes in networks and international aspects of information technology.

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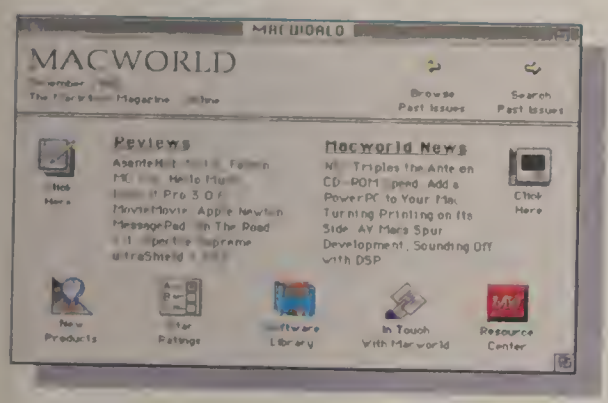

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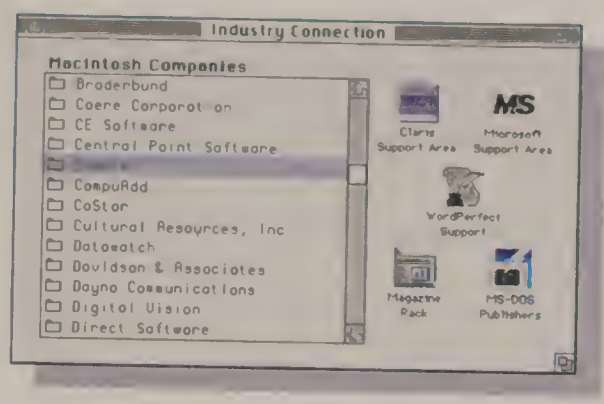

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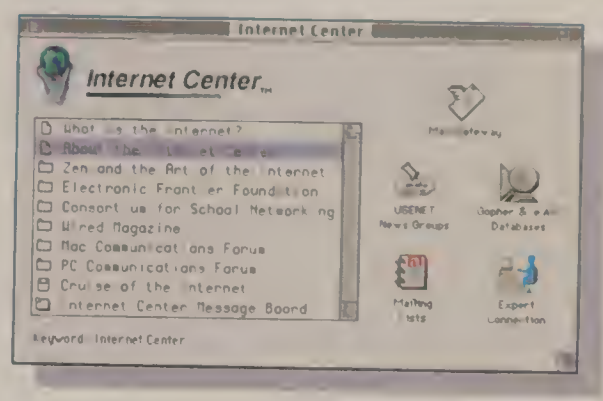

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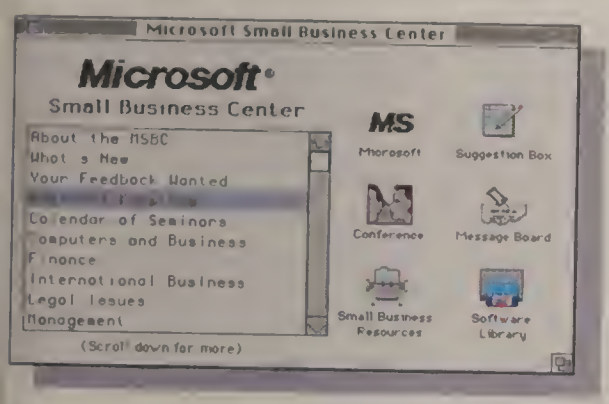

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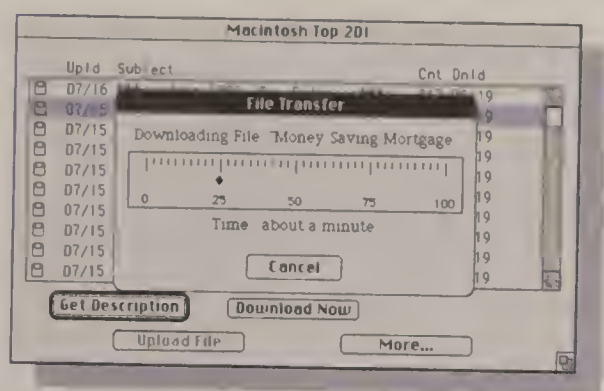

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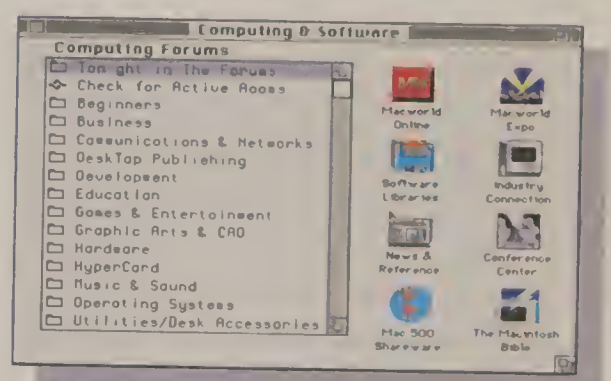

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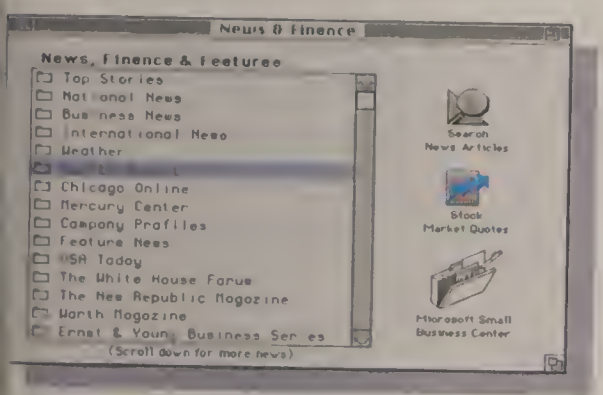

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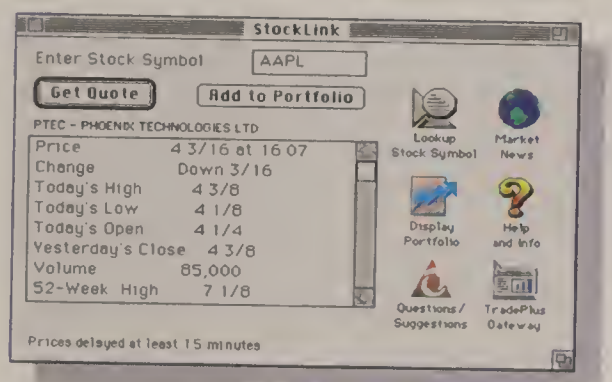

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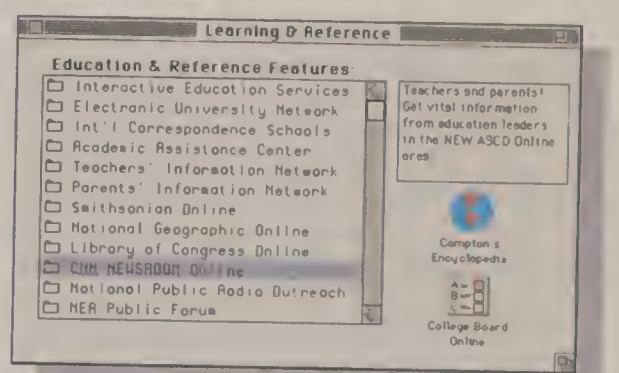

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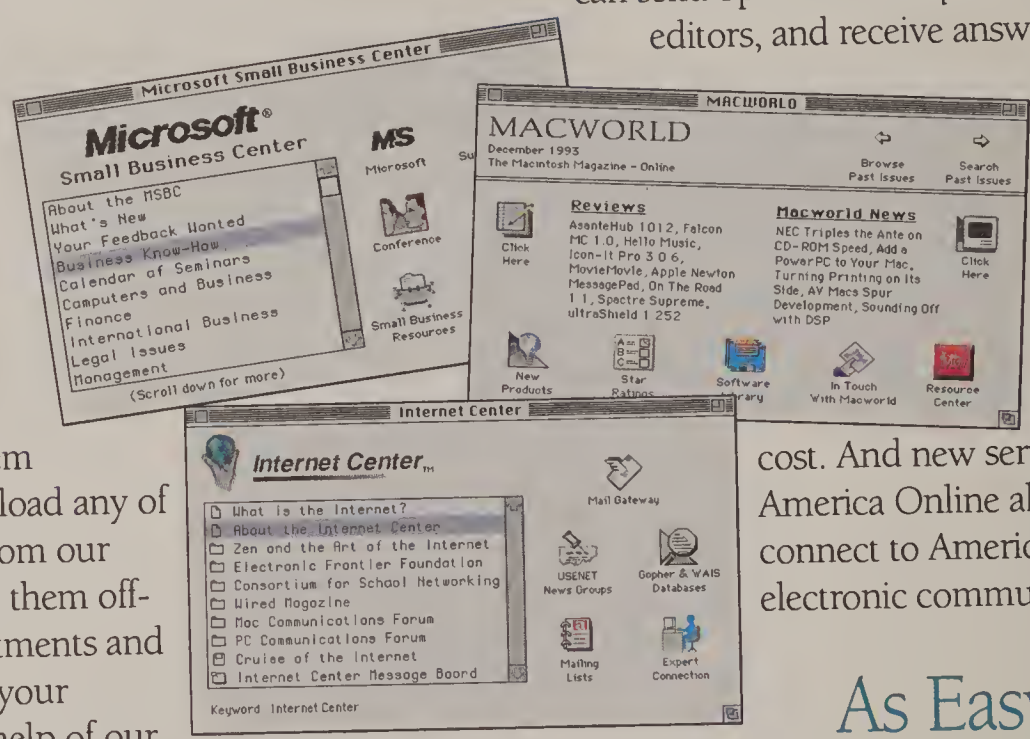

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BY CARY LU

PowerBook Notes

A Newton Status Report

THE NEWTON, APPLE'S FIRST ALL-NEW computer in a decade, has received widespread publicity and almost equally widespread derision in the months after its release. Many people know little about the Newton except that its handwriting recognition produced hilarious results in the *Doonesbury* comic strip.

As the most obvious Newton feature, handwriting recognition has received much misplaced attention from the media. First of all, to be useful the Newton needs a mass of information—some kind of database such as an address book or a product catalog. Even if the Newton had perfect handwriting recognition, it would be much too laborious to enter several hundred names and addresses by hand, especially since that data is probably in a computer already.

In its current form, the Newton's handwriting recognition is adequate for annotating, editing, and otherwise manipulating data. As users know all too well, the Newton's handwriting recognition could stand much improvement, but it is possible to achieve acceptable results. Many complaints came from people unwilling to put any effort into learning how to cope with the recognition process, people who have forgotten that they once had to learn to type. Whether you write on paper or on a Newton, you must make sure that your 2 looks different from your Z. Even a major weekly computer magazine insisted that the Newton had made a mistake when its published example showed obviously careless writing. If you are not willing to adapt to a new device, don't buy a Newton.

There are some psychological issues as well. In the early days of computers, no one expected—or got—a user-friendly interface. The friendlier computers have become, the more people expect. Everyone knows that they make typos on a keyboard. When was the last time you heard someone say, "I made a write-o"?

Although the recognition will certainly improve, I doubt if it will reach 99 percent accuracy, the minimum I consider acceptable in an OCR program. I can't read my own handwriting with 99 percent accuracy.

Getting Information into a Newton

So how can you get information into a Newton? For your own information, you need Apple's Newton Connection Kit for a Macintosh or Windows computer. The Connection Kit version 2 (previously called the Connection Pro Kit) supports direct data interchange with the most popular desktop word processors and spreadsheets in native formats, and with many programs, including databases, via standard interchange formats (text, tab and comma delimited, and so on). Curiously, version 2 is not expected to support the native file format of any current Claris product.

Or you can get packaged information. A company can put descriptions of its products, customer information, and order forms on a Newton for its sales staff. Medical personnel can use a Newton to take and check patient histories. For such highly specific information, a Newton is simpler, quicker, and more interactive than a computer or a paper form.

Several software publishers, led by StarCore, Apple's new publishing arm (800/708-7827); offer more general information, such as the Fortune 500 Guide to American Business and various travel guides. The titles announced thus far aren't very compelling. The few people who really want to compare the financial performance of, say, Ford versus General Motors, will probably do it on a desktop computer. Similarly, guides to cities, and other casually consulted information, even with a Newton's point-and-touch interface, don't compete well with paperback books.

Newton Applications

Applications for the Newton are beginning to appear (all the products described in this column were scheduled for shipment no later than the first quarter of 1994). Among the most ambitious is a flat-file database named FilePad, from HealthCare Communications (402/489-0391, 800/888-4344). Scheduled to ship March 1, it will retail for $159.

For numerical computation, MobileSoft (408/376-0497) has a nicely done

continues

spreadsheet program, MobileCalc, and its MobileMath program does financial and scientific calculations through a menu-driven interface. Dubl-Click's GoFigure (distributed by StarCore) emulates a dozen types of calculators, complete with on-screen function keys.

Many programs take their cue from the Newton's organizer functions, such as expense-account tracking and time billing. Other Newton applications work together with existing programs for the Mac or Windows, such as the groupware program Meeting Maker from On Technology (617/374-1400; 800/548-8871).

Communications

I don't believe that there ever will be a killer app for the Newton and other PDAs, a single program that could drive the market. Instead, communications as a group will make the initial case for a Newton. Several products deliver at least parts of the communications promise.

• **Wireless data** ETE (619/793-5400, 800/793-9696) is showing the ETE Communicator (due second quarter of 1994), a box a little larger than the Newton that promises four modules: a conventional modem, a cellular phone with analog modem, a packet radio, and a global-positioning satellite receiver. The Communicator can take any two modules; you have to specify which ones you want when you buy it, since the modules cannot be swapped by the user. ETE expects each module to cost about $500.

The two-way wireless packet radio module operates at 8 Kbps on the 900MHz RAM Mobile Data system in the United States, and the Rogers Cantel system in Canada; charges range from $25 per month for basic service to $135 per month for unlimited messages (908/602-6555; 800/726-3210). As with other two-way radio systems, battery life is a critical issue.

The cellular-phone module supports voice operation as well as an optional MNP Class 10 error-correction protocol for data, using an ordinary analog telephone connection. Data over cellular phones should improve once the new digital cellular telephone systems are in place—and after the protocol battles are settled.

• **Paging** Apple's $229 Newton Message Card supports one-way messages via the MobileComm paging network (601/977-0888; 800/474-6374). The card can receive on its own; when the card is inserted into the Newton, you can read a message of up to 500 characters; longer messages can be sent in multiple pages. Service fees run $21 a month for

continues

CONNECTING POWERBOOKS AND VIDEO MONITORS

All PowerBook models except the 100, 140, 145, and 170 can drive an external color or monochrome monitor. The all-in-one PowerBooks come with a small cable adapter that ends in the Mac's standard 15-pin video connector; the Duos require a dock with a video port. Standard Macintosh monitors connect easily. VGA and multisync monitors require an adapter; VGA/multisync monitor have 15 pins in 3 rows instead of the Mac's 15 pins in 2 rows.

From here it gets complicated. Cable adapters come in several forms.

▪ **Fixed VGA adapter** If you have a nonmultisync VGA/SVGA monitor, this type of adapter is your only choice. Through the Monitors control panel you can switch between VGA (640 by 480 pixels) and SVGA (800 by 600 pixels). Unfortunately, if the monitor doesn't support SVGA, you'll lose the image and will have to shut down and disconnect to recover. The images display at a flickery 60Hz (VGA) or 56Hz (SVGA) refresh rate. The SVGA is acceptable only for a few minutes of work. James Engineering (510/525-7350) and many others supply such adapters.

▪ **Fixed Macintosh mode adapter** You can use this type of adapter for either VGA/SVGA or multisync monitors. These usually support either the Macintosh 13-/14-inch image pixel count (640 by 480, 67Hz refresh) or the 16-inch pixel count (832 by 624, 72Hz), but not both. Such adapters produce flicker-free images, but you can't switch among the image sizes that a multisync monitor can support. Nevertheless, many multisync-monitor manufacturers supply a fixed monitor adapter. NEC, for example, supplies seven different fixed monitor adapters for various Macs and screen sizes.

▪ **Switchable Macintosh mode adapter** This type of adapter is necessary only for multisync monitors. A small switch selects among the common Macintosh video modes. These are more flexible than the fixed adapters. They will work with almost any Mac-compatible monitor, although only a multisync monitor can use more than one mode. You can run a large-screen multisync monitor normally at, say, 832 by 624 pixels, and switch to a 640 by-480-pixel image for a group presentation.

The Macintosh mode adapters frequently run into a problem. Apple has changed the way it connects synchronizing signals. Many cable adapters support the sync-on-green signal that was used in older Macs, including all Duo docks available through the end of 1993. The all-in-one PowerBooks (along with the Quadra AVs and other recent models) use a separate sync line. With the wrong adapter, the image appears either completely fractured or with the top half of it skewed. Some newer cable adapters can correct this sync problem.

The most flexible cable adapter I've seen is the Liberty ($39.95) from Enhance Cable Technology (408/293-2425, 800/343-2425). It supports every Mac video mode plus VGA and SVGA modes with an 11-position switch; a set of 9 DIP switches gives you control of sync signals and future monitor types. The Liberty adapters are not easy to set, especially if hidden behind equipment. And many modes are not supported by a PowerBook.

The more common switchable mode adapters set four Mac modes—13/14-inch, 16-inch, 19-inch, and 21-inch, although PowerBooks support only the first two. Such adapters are easy to set and are available from many companies, including Intellisoft (818/577-5679) and Interex Computer Products (316/524-4747). Enhance and Intellisoft also offer adapters for the fairly rare multisync monitors that come with a Macintosh-style video plug.

If you are crowded for desk space, you can share one monitor with two computers. The most common two-way or four-way video switches have VGA-style plugs and sell for $10 to $60. Video switches with Mac-style DB-15 plugs are much harder to find, but Redmond Cable (206/882-2009) has them in two-way ($54.75) and four-way ($69) configurations. Switching the video signal while computer and monitors are on doesn't cause any problems, but make sure you have set the video switch correctly before turning on the Mac. When the Mac turns on, it checks the video cable to determine presence and type of monitor, so you need either a monitor or at least a VGA/Mac video-mode adapter connected; otherwise the Mac will not send a video signal to the monitor. The switch boxes require a video extension cable for hookup. Cable quality counts; a badly made cable with insufficient shielding will result in ghosts on the screen.

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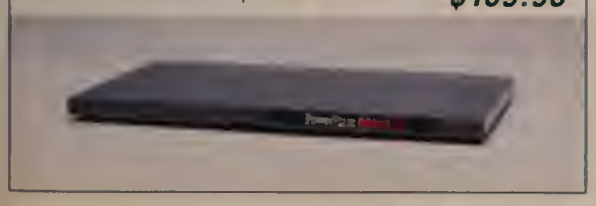

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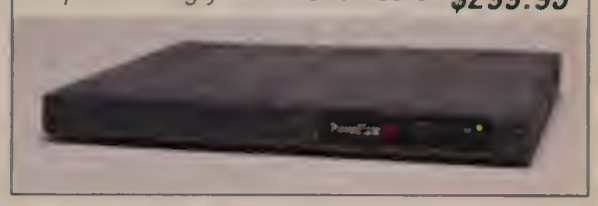

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• **Newton-specific mail service** NewtonMail from Apple is designed as a Newton-specific mail service, fully integrated into the Newton interface with connection by modem. It costs $14.85 a month for two hours of connect time ($8.95 per month for off-peak times) and can connect to most other mail services through an Internet gateway.

• **Conventional online services** Ex Machina (718/965-0309, 800/238-4738) offers PocketCall ($149 through StarCore), a pen-driven communications program that links a Newton to popular online services such as CompuServe, MCI Mail, and Dialog Information Services, as well as to cc:Mail, the corporate E-mail system from Lotus.

• **Fax** The Newton can send faxes easily with a fax modem. Apple's Newton Fax Modem PCMCIA card has joined the earlier Newton Fax Modem, a serial-port outboard modem. Both modems have the same functionality; the PCMCIA version is more compact and convenient, but it takes up the card slot. With Apple's software, the Newton cannot receive faxes; ETE promises fax reception when it ships its Communicator modem module.

• **Wireless networks** Digital Ocean (913/888-3380) has announced a wireless LocalTalk network. Its low-powered $699 radio transmitter/receiver is about the size of a Newton, has a range of a few hundred feet at most, and doesn't require a transmitter license (the more powerful packet-radio systems do).

Newton's Future

Beyond communications, what the Newton needs most is an industrywide structure for information so it can exchange data with other computers smoothly regardless of operating system and applications. Then a future Newton—with greater computing power and memory—can truly replace a notebook and file folder of papers; a user can review, edit, annotate, send, and receive information without getting lost in the operating-system and file-type mess that complicates so much data transfer today.

The type of messaging structures built into General Magic's Telescript and the document-oriented operating systems promised for desktop computers in the next five years should go a long way toward making future Newtons a standard part of our lives. **m**

CARY LU is a *Macworld* contributing editor who covers mobile- and remote-computing issues in this monthly column. His books include *The Apple Macintosh Book* (Microsoft Press, 1992).

THE DESKTOP CRITIC

BY DAVID POGUE

Backup, Straight Ahead

Personal backup programs: digital life insurance

ONLY THREE THINGS IN life make me queasy enough to change color: one, approaching the end of a four-hour cab ride and discovering I don't have my wallet; two, realizing that the guy I've just described as a "quivering crumb-covered clod" has been listening in on the speakerphone; and three, waking up to a dead, unbacked-up hard drive and realizing that my digital life is over.

Software can help the third case. (Self-help books may help the others.) Of course, the simplest way to back up your documents is to drag their icons onto the world's cheapest backup devices: floppy disks. Backup *software*, however, automates the process, tracking which files need to be backed up, when you need to feed in another floppy disk, and so on.

Incidentally, since these programs are so similar, and since there's about a gazillion of them, I'll make several space-saving references to the features table. (Also incidentally, I'm omitting the megalithic, wonderful, complex Retrospect from Dantz Development, which can't quite qualify as *personal* backup software.)

Apple Backup 1.1

This program comes with Performas and certain PowerBook models in lieu of proper system disks (Apple Computer, 408/996-1010). Apple Backup, to be blunt, bends over backward to be barebones. Whopping limitation A is that the program only backs up onto high-density floppies (and not to, say, a hard drive or cartridge). Whopping limitation B is that you get only two choices of what to back up: your System Folder or your entire hard drive. "You'll need 93 floppy disks," it cheerfully burbles. "Copying will take about 300 minutes." Hey—you get what you pay for.

DiskFit Direct 1.0

Take one Apple Backup. Stir in the ability to select which folders you'd like copied. Yield: This $49.95 program (Dantz Development Corporation, 510/253-3000). It's the least expensive way to buy into the real magic of backup software: each time you run the program, it backs up only the files you've changed since the last backup. In other words, the more faithfully you back up, the easier and quicker it becomes.

DiskFit is good because it copies your stuff as regular Finder icons. Big whoop, right? Actually, it's a sizable whoop: some backup programs (Apple Backup, for one) encode your backed-up files into a special format, sometimes even wadding them up into one gigantic file with a generic icon. That gains you speed and disk space, but you need the backup program to unlock any files you'll ever want to see again.

You can't specify files to include or exclude from the backup—only entire folders. So if there's a big fat 50MB QuickTime file on your hard drive, it's going to be backed up whether you like it or not (unless you stick it into its own folder, of course). Otherwise, DiskFit Direct, with features 1, 3, 6, and 14, is the ideal backup program for the feature-phobe. May I have this Dantz?

DiskFit Pro 1.1A

This program (Dantz again, $125), obviously, is DiskFit Direct's souped-up sibling. It's still impressively direct, however; you can make almost all the necessary settings in a single main window, easily qualifying for feature 14.

So what does the extra $75 buy you? Automatic backups, for one thing; the program can update your backups every time you turn off the Mac. There's also a very cool System 7 feature: you can have a folder full of aliases deposited on your hard drive. Next time you need a backed-up file, just double-click on its alias, and the Mac will handily request the specific disk it's on. Neat trick. One more nice touch (also in DiskFit Direct): If you have to stop backing up (for example, when you run out of patience, floppy disks, or Snapple), the program remembers and can later pick up where it left off.

Alas, like DiskFit Direct, Pro doesn't grant you control over individual files. And if you're going to spend this much money, you really should get features 11 and 12 in the bargain.

FastBack Plus 3.0.1

This program coulda been a contenda (Symantec Corporation, 408/253-9600; $149). It's rich in features: in fact, it's got 1 to 4, 6 to 8, the ingenious and indispensable 9, 10 (though it's completely inaccurate), 11, and 13. And sure enough, true to its name, it's fast.

I say it *could* have been a contender—if this program were a little less sloppy. It would look nice, if it weren't for the multiple fonts mixed on screen like potluck. It would be easy to use, if Macintosh interface guidelines weren't broken like toothpicks. (What *are* those hybrid button/icon/pop-up menus on the main screen?) It would be easy to learn, if only submenus wouldn't vanish and reappear seemingly at random. The manual would be reassuring, if only somebody would proofread it. Ironically, the mysteriously discontinued FastBack Express was a better-designed, more successful program.

Alas, you can get most of the same features in much more polished packages.

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ALTERNATIVE BACKUP LIFESTYLES

Some of the most effective backup programs aren't backup programs at all. Some folks use PowerBook file-synchronization programs as backup software on desktop Macs (to sync a SyQuest backup with a hard drive, for example).

Then there's Magnet. This little utility (No Hands Software, 415/802-5800; $129.95) can scavenge your hard drive for all the files that meet a certain criterion (only today's work, only Word files, only small files, whatever) and copy them to a specified disk or cartridge. It can make this copy automatically at specified times, when you shut down, or—get this—when you *insert* the backup disk or cartridge.

And there's the lovable CopyDoubler 2.0 (Symantec Corporation, 408/253-9600; $59.95). It's designed primarily to speed file copying and Trash emptying in the Finder. But CopyDoubler doubles as the ultimate backup system for lazybones. You indicate which folders you want copied where, and when (at a keystroke, at a specific time, or at shutdown), and this control panel speedily does the rest.

FileDuo (ASD Software, 909/624-2594; $149) is almost identical. It lacks the Finder-acceleration functions, but it adds the ability to create automatic *generational* backups—that is, when it backs up your work on Wednesday, it can preserve the stuff it copied on Tuesday, so that you've always got (for example) three safety copies. You can have it skip over your System files or applications, since you've probably got those safely on their original floppy disks anyway.

The only substantial bummer about these three programs is that they can't copy a whole hard drive's worth of data onto a bunch of floppies like a proper backup program. (All your backuppable stuff must fit on a single backup disk or cartridge.) On the other hand, they can grab worthwhile folders (you don't really need to back up your After Dark folder daily). They can copy your stuff from multiple disks onto a single backup disk (most of the purebred backup programs can't do that). And if you have them kick in at shutdown, these control panels do the deed and then turn your favorite machine off for the night.

If I'd paid $150 for this thing, I'd take FastBack back fast.

HFS Backup 3.5.9

Remember this little number from the 512K Mac days? It used to come with those MacBottom hard drives, and it got the job done (PCPC, 813/884-3092; $99.95). It still does, complete with features 2, 3, 5 to 8, 13, and 14. But its small, unresizable, black-and-white screen needs to be drop-kicked into the nineties.

Reviewer's dilemma: Is it right to dismiss a perfectly able program just because it *looks* old and abandoned? Reviewer's answer: Yes, if more attractive candidates are available for less money.

Central Point Backup

Because this program is only a face in the crowd of MacTools 3.0 utilities (Central Point Software, 503/690-8090; $149), you'd be forgiven for assuming it's somewhat stripped-down.

You would be wrong. Amazingly, CP Backup is utterly feature-packed (*all* of the numbered goodies except 5, 9, and 11). For people well endowed with storage gadgets, you can even back up *multiple* disks simultaneously (and *to* multiple disks, if you wish). Yeah, there are

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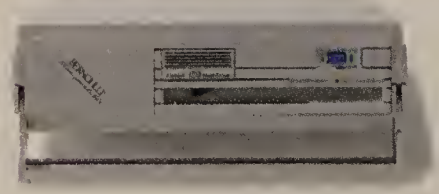

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50 million options, but you can ignore them or set them up once and forget them forevermore.

Considering that you get powerful antivirus tools and a useful hard-disk care-and-feeding kit in the same box, CP Backup makes a mighty appealing candidate. (Before you buy, you should ask around to find out if Central Point has steamed away the buglets from the other MacTools modules.)

Norton Backup

Remember Norton Utilities for Macintosh? Heaven knows why Symantec (408/253-9600) has lavished so much neglect upon what was a best-selling utility. In any case, this program hasn't been overhauled since 1992 (version 2.0), and it shows. The backup module is feature-feeble (it has features 1, 4, 5, 6, and 7). I don't care for the fact that it only backs up into an encoded format that, without the program, is inaccessible to human beings. Mainly, though, I don't think it's worth $149 for this group of geriatric software gewgaws.

Redux Deluxe

Redux Deluxe qualifies strongly for feature 14, the ability to ignore the manual, because of its clean approach (Inline Software, 203/435-4995; $79.95). On successive screens you're asked: Backup or restore? To where? And which files? If there's a simpler, cleverer way to package features 1, 3 to 7, 11, and 14, I don't know what it is.

Like DiskFit, Redux remembers where you left off in the middle of a backup. As in most of these programs, you can view a hierarchical list of your hard drive's contents, making it easy to select items you want backed up—but Redux's list is clear, big, and colorful.

I don't mean to get gushy, but the manual's good, the phone-help people are helpful, and the whole thing is fantastically obvious and quick. Somehow whacking your way through those question screens even makes data safety a weensy bit *fun*. (Heresy!)

The Upshot

If you're into steadfast, regular, hard drive–wide protection, I declare the cost/simplicity/feature to be Redux Deluxe.

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12. Can mix backup disk types (floppies, cartridges) for one backup.
13. Can check for viruses during backup.
14. Easy enough to use without a manual.

Contributing editor DAVID POGUE lives in New York City, where he's taught such Mac fans as Mia Farrow, Carly Simon, and Stephen Sondheim about the treacherous ways of magnetic media.

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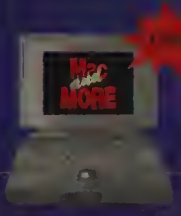

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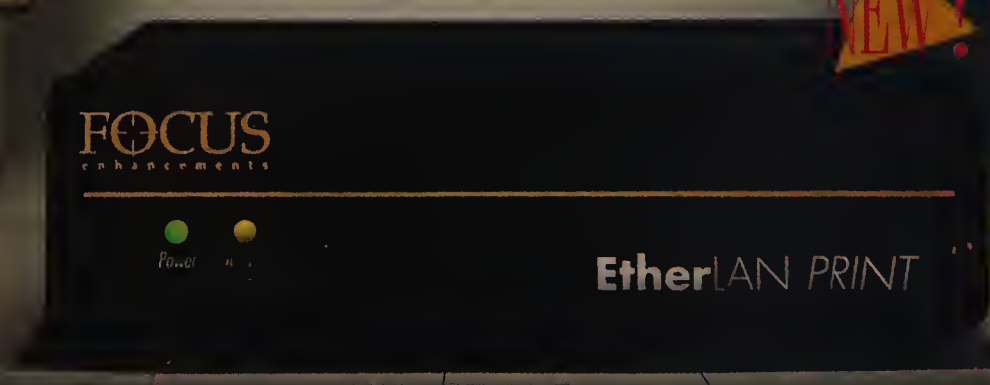

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THE ICONOCLAST

BY STEVEN LEVY

The Edict of WORM

A small rebellion over Apple's policies

ERIC MARTIN DID NOT HAVE A lot of money to spend on a computer in late 1992. So he had to be careful. Like all potential Mac owners, once he settled on the idea of purchasing a Macintosh, Martin was faced with the decision of which model to buy. At any given time there are plenty to choose from—Quadra, Performa, PowerBook, Duo—all suffixed by confusing combinations of letters and numbers.

Martin, however, is fairly adept at deconstructing such symbols—he is a graduate student in linguistics at a college in Illinois—so he persevered. He did some research, read some publications (including this one), and finally came up with what he thought was the most intelligent choice: a Macintosh IIvx, which came with 5MB of memory, an 80MB hard disk drive, and a built-in CD-ROM drive. Short of buying a pricey Quadra, it was the most powerful machine he could get. He paid $2900 for the box—the lowest price he could find, from a mail-order house. A keyboard and used monitor brought the total to around $3500. Thanks to the computer, his Christmas was merry, indeed.

Then came 1993—a year of the Grinch. Martin's spring was soured when Apple released a new line of computers called Centris. They appeared to be as powerful as the Quadras that he had previously lusted after but could not afford. Only, the Centris line *was* affordable. If only he had known! We may call this The Injury. The Insult came when Eric Martin saw what had happened to the price of the computer he did buy—the suddenly obsolete IIvx. The price was $600 or so less than what he had paid before the Centris machines were introduced. A few more months and the price went down *another* $600 or so. The object he had devoted so much time and energy toward purchasing—the machine that was now the engine of his labors—was being hawked in the marketplace like a remaindered pop novel that never quite made the best-seller list.

A Protest Is Born

Now, Martin had no problem with the IIvx he bought. The computer was doing everything he asked it to do. In fact, it has converted him into an admitted Macintosh fanatic. But the graduate student is not an Apple fanatic. As Martin tells it, the executives at Apple shamelessly pushed the IIvx on unsuspecting users with the full knowledge that a lower-cost, more-powerful alternative was in the works. Treating customers like this would only hurt Apple in the long run, he believed. And as Martin attempted to express his feelings to Apple on its toll-free support line, he was cut off when the Apple representative learned that Martin had purchased his Mac from a mail-order house, unauthorized by Apple. Didn't Apple realize that he was their customer, too? If this went on, Apple would reap nothing but ill will from its supporters, and soon there would be no Apple.

So Eric Martin decided to do something about it. He began an organization called WORM, or Worldwide Owners of Ripoff Macs. (In addition to the IIvx, the Ripoff Macs include the terminally lame PowerBook 165c and the entire Centris line, which lasted less than a year before reemerging as Quadras.) His arena was the conferencing system on America Online, where Martin is known as Rominger.

Martin posted a manifesto, beginning "WORM . . . has been formed by loyal Mac users who feel abused by the current Apple management" and including a list of demands ranging from the eminently reasonable to the completely outrageous. These include a minimum of 8MB of memory in all Apple machines; low-cost logic-board upgrades; and mandatory bundling of the complete HyperCard, QuickTime, and PC Exchange programs. WORM doesn't spare the magazines, either—he calls for *Macworld* and *MacUser* to renounce their nondisclosure plans and tell prospective buyers what's in the pipeline so they can make purchase decisions more intelligently.

The reaction to WORM was mixed. Some people posted messages in agreement, while others accused the WORM contingent—Martin claims about 40 to 50 people who call themselves WORM folk—of whining. But anyone familiar with the history of personal computers in general and Apple in particular can see that WORM's complaints are not original. These are things that have bedeviled users for years—and they are certainly worth talking about. Whether they are truly valid gripes is another matter.

Sucker Play

It's probably no accident that the computer that produced a rebel outcry was the IIvx. If someone were to identify The Macintosh for Suckers, this would be it. Not because it is a bad machine—far from it. If the IIvx were truly one of Apple's more hideous blunders, a first-ballot entrant to the Hall of Shame like the Macintosh Portable and the PowerBook 165c, those who bought the machine could simply be written off as clueless novices who didn't do their homework. No, the problem is that the IIvx was, for a brief shining moment, forwarded as one of Apple's winners—the slickest 'puter this side of the Quadras.

continues

So those who congratulated themselves for buying the IIvx in 1992 naturally got that sinking feeling when Apple hastily tossed it into the dustbin of technology.

Yet, as Eric Martin admits, the computer does what people bought it to do. The real misery is not so much that Apple released a more powerful machine than the IIvx for the same price, but that he was forced to see the same computer that cost him nearly $3000 sink in price to its current $1300 or so, barely a year later.

The complaint goes like this: Everybody expects the price of computers to fall eventually, but not *that* much. It makes the buyer feel like he or she has been swindled. The WORM contention is that by selling a computer at that price for such a short time, Apple is alienating those who buy it—and also throwing fear into potential buyers who saw what happened to the IIvx.

Of course, looking at it from Apple's point of view, the situation was quite different. The IIvx was an improvement over predecessors like the IIci and was reasonably priced, given that Apple believed in 1992 that it could still extract a premium from its customers simply because it was Apple. While the Cupertino decision makers certainly knew about the Centris line, those computers would not be ready until 1993. Should Apple have withheld the IIvx line for that reason? Perhaps. Should Apple have warned its customers that a more powerful computer in the same price range would be available in a few months? Yeah, right—*that* would have done wonders for its sales.

Bottom Line

No matter how you slice this salami, it tastes the same: the type of people who pride themselves on getting the best possible deal will find that buying a computer is an exercise in humiliation. Now more than ever, the models are coming fast and furious—we're talking Sony Walkman–production speed here—and the prices are getting cheaper than ever. Every time things seem to level off, a new round of price cuts begins. For a long time, Apple's prices were more stable than those of other computer companies competing outside the Macintosh arena, mainly because it held a monopoly in its realm and the prices were simply too high to begin with.

Even so, if you look at some of the initial prices of high-end Macintoshes, early Apple owners have had to be reconciled with the pain of seeing latecomers rack up relative bargains. I recall Mac IIfx's going for $10,000 or so—now one of those babies can barely compete with a Quadra 605 that goes for 900 simoles. (I also remember paying $600 to upgrade my 128K Mac to a 512K Fat Mac. It was worth it.)

What made the Mac IIvx so painful for those who bought it was a quirk in timing. This was the moment that Apple, after nearly a decade of shortsighted profiteering, finally decided that it would price its computers aggressively. A prospective buyer no longer had to pay a premium simply because the machine was a Macintosh. Far from putting the company in danger, this was a long-overdue action that will do more to help Apple than any other move it could possibly have contemplated.

The WORM Turns

This is not to say that WORM and Eric Martin don't have some excellent points to make about Apple's other practices. (And to be fair, Martin says that WORM's focus is no longer on the IIvx, but on Apple's general policies.) For instance, the failure to bundle PC Exchange with every computer is not only foolish but also seems to border on a case of false advertising, since Apple commercials prominently feature that little utility as a prime reason to buy a Macintosh. Martin's demands on memory are also to the point: anyone who uses System 7 with less than 8MB of memory is working with a crippled computer. (What makes it worse is that Apple generally sells PowerBooks in 4MB configurations, forcing users to buy more memory as well as to pay some technician 75 bucks to put in the SIMMs.)

The refusal to deal with mail-order customers on the support lines is something else that Apple should reconsider. And finally, the all-too-frequent confusion in the product line (from IIvx to Centris to Quadra, all in one year) does give people the impression that the folks in Cupertino aren't worthy of our confidence. Especially when some of these computers use different cards, have different memory specs, and require different connectors to peripherals. It all makes for messiness, and ultimately, unhappiness.

But when it comes to the main event, WORM can't slither away from the truth. Apple isn't ripping people off by cutting its prices or releasing new computers: it's serving the entire community by extending Macintosh power at more reasonable prices. We're getting cooler machines at lower prices—for this we should complain? m

STEVEN LEVY's new book, *Insanely Great: The Life and Times of Macintosh, the Computer That Changed Everything* (Viking, 1994), is at a bookstore near you.

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CONSPICUOUS CONSUMER

BY DEBORAH BRANSCUM

Low-Cost Computing

Budget-conscious ways to outfit your office

HIGH-END PRODUCTS MAKE sense for professionals such as graphic designers whose work demands speedy hardware and complex, multicapability software. But the fact is, many businesses can make do without the latest and greatest in Macintosh technology. The used-computer trade and the proliferation of inexpensive software open cost-saving opportunities for mainstream business buyers. Read on for strategies that can save you money.

User-Group Discounts

User groups have always been a terrific source of information about computing, but now they're also an outlet for discounted Macintoshes and Apple peripherals. Members of Apple-authorized groups can buy refurbished Macs with 90-day warranties for very good prices. (To find a group in your area, call Apple at 800/538-9696, ext. 500.)

During January, for example, several deals were offered to MUG members. The discontinued Performa 600 5/160 with a CD-ROM drive (without monitor) sold for $999, about $800 less than it was going for last fall. A 16-inch RGB monitor Apple introduced in 1992 at a retail price of $1599 was for sale at $999. The discontinued Performa 405 4/80 with a 0.39mm-dot-pitch monitor originally sold for about $1300. MUG members could buy it for $659.

Buying discounted equipment is "kind of a pain," says Ray Kaupp, manager of the User Group Connection. "It's first-come, first-served. Quantities are limited. . . . If you need a machine right now, this is not the way to do it. But if you want a good price and can afford to wait several weeks, it's a great deal."

You can sometimes get new products through this program, but most of the items have come back to Apple from dealers because they malfunctioned or because of excess inventory after a product was discontinued. Apple technicians check the equipment, fix it if necessary, and send it off to the User Group Connection for distribution. The User Group Connection currently offers only Apple products; Kaupp hopes to sell third-party products in the future.

Computer Brokers

If the User Group Connection program doesn't work for you, consider used equipment. But remember, these days Mac prices match those of the machines' Intel-based rivals, so you may be able to afford a new Mac. If not, brokers, newspaper and online classified ads, and direct-mail companies all offer ways to buy secondhand computers.

The Boston Computer Exchange (617/542-4414) began as a liaison between computer sellers and buyers. Now, it purchases equipment directly from sellers, including dealers. To receive a faxed listing of its used-computer index and inventory, call 617/542-2345, ext. 300. BCE gives buyers a seven-day warranty.

The American Computer Exchange (404/250-0054, 800/786-0717) in Atlanta and the National Computer Exchange (212/614-0700, 800/359-2468) in New York do not buy equipment directly from sellers but instead match computer equipment buyers and sellers.

The American Computer Exchange (*Macworld*'s source for the "AmCoEx Index of Used Mac Prices" in *News* each month) charges sellers a $25 listing fee and a 10 percent sales commission. After a sale has been negotiated, AmCoEx runs diagnostic tests on the equipment before shipping it to the buyer. For a $25 escrow fee, buyers get 48 hours to check out their purchases before sellers receive payment.

At the National Computer Exchange sellers pay a 15 percent sales commission. Once a deal is made, the sellers insure and then ship it directly to buyers, who have 48 hours to examine it before the Exchange releases payment to sellers.

Buy a used computer for its utility and not its price, because the price will continue to drop. Apple product announcements and price cuts affect resale value dramatically. Where you live also affects the price of used computers. And don't forget to use a credit card if you buy by direct mail. If it's a private transaction arranged via classifieds, meet in a public place to examine the equipment before you pay for it.

Auction Madness

Last November and December the Silicon Valley firm of Ross-Dove helped Apple sell 21,000 products, including computers, peripherals, and T-shirts, at auctions held near Washington, D.C., Chicago, and Boston. For most buyers, the auctions were "an opportunity to buy something for a little less than what they would pay in the store," says Ross-Dove president Kirk Dove. A Quadra that might sell in a store for $4000, for example, could be had for $3600 to $3700. In general, buyers at auction might save only 5 to 10 percent on a truly state-of-the-art product, while equipment made obsolete by new models often goes for 10 to 25 percent below store prices.

Auctions are fairly common in the computer industry, and Ross-Dove has held auctions for clients such as IBM, Hewlett-Packard, Businessland, and Dell.

continues

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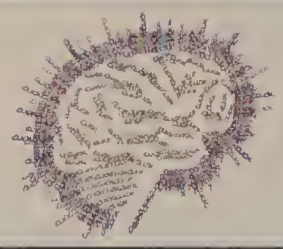

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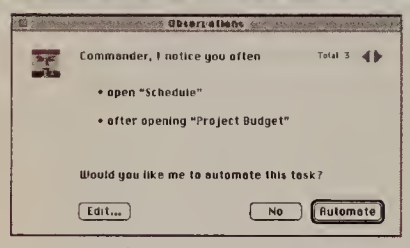

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Circle 18 on reader service card

To get information on upcoming Ross-Dove auctions, call 415/571-7400 or 800/445-3683.

Expand Your RAM

RAM isn't as expensive as it used to be, but it's still not cheap. At press time, the price of 4MB of physical RAM ranged from about $140 to $200, depending on the Macintosh model. Connectix Corporation's RAM Doubler is a new system extension that roughly doubles the memory of your Mac. Mail-order companies such as MacConnection sell it for about $55. RAM Doubler works with any Mac II, LC, Performa, PowerBook, Centris, and Quadra computer with 4MB of RAM or more, according to the company. The product is not bug-free, but BMUG gave it a thumbs-up at January's Macworld Expo in San Francisco. (A *Macworld* review is under way.)

Members of AppleLink, America Online, and CompuServe can buy RAM Doubler for $49, plus shipping, through Connectix's forums. (If you're not online, you can't be part of the program. If you are online, simply go to the Connectix forum to find details.)

Money-Saving Software

Low-cost programs exist for many applications, including word processing, graphics, and business. Integrated packages are a great deal for people who need low-cost access to word processing, spreadsheets, communications, databases, and drawing tools. At press time I found Symantec's GreatWorks for as little as $87 by mail. ClarisWorks won the *Macworld* Editors' Choice in "Integrated Software" (February 1994)—but it's more expensive at about $200 by mail. Still, at press time ClarisWorks was being bundled with Intuit's Quicken, a great finance program for individuals and small businesses. (For other inexpensive business choices see *Conspicuous Consumer*, November 1992.)

There are many low-cost stand-alone graphics programs to choose from. Expert Software's Expert Color Paint, for example, won a *Macworld* Editors' Choice as best budget buy (see "Brilliant Strokes," September 1993). Expert ColorPaint, like its companion package ExpertDraw, is an entry-level package not meant for experts, but at street prices of about $30 both are fine for basic painting and drawing tasks. A new package, Dabbler from Fractal Design, is expected to be out by the end of March for a street price of about $65. It's intended to help teach people how to draw and paint and includes many of the "natural-media" tools found in Painter, such as crayons, felt pens, and chalk. (Dabbler is not compatible with all Macintoshes.)

On the DTP front, Aldus recently cut the price of Aldus Personal Press 2.0 and added more than 50 document templates, 12 TrueType fonts, 100 ClickArt images, and 25 sheets of paper. The bundle, called Aldus HomePublisher 2.0, has an estimated street price of $50. Personal Press, at about twice that price and without the bundle, rated only two stars in our March 1993 review, but it may meet your needs; the company says an update is forthcoming. If you're willing to spend more, consider Publish It Easy; it won three stars in the same review and is available for about $115 from mail-order companies.

Shareware

If commercial software seems too pricey, consider shareware, which is not free but is generally less costly than mainstream applications. Most Macintosh user groups make shareware available on disk; many programs are also available online. The Boston Computer Society's Macintosh special-interest group, BCS Mac (617/864-1700), does a terrific job rating some 1800 shareware programs in a HyperCard-based catalog that's available on disk to nonmembers for $7. The rated programs are part of the BCS Mac Software Exchange Library and can be purchased for $7 per disk. The catalog plus all 1800 shareware programs are available on CD-ROM for $55.

The Mac Shareware Emporium (Brady, 1992) and *The Mac Shareware 500* (Ventana Press, 1992) also rate shareware. Both books include disks of shareware; *Emporium* is priced at $34.95 and *Shareware 500* at $39.95. They are generally available through bookstores.

Toner Tune-up

You can make printing less expensive by using a print utility called Toner Tuner. Toner Tuner is available directly from Working Software (408/423-5696, 800/229-9675) for $24.95. This simple utility enables users to choose the amount of toner applied to each print job, reducing overall toner use. Our reviewer gave it four stars (December 1993); note that there are some incompatibility problems.

I've only scratched the surface of low-cost computing. If you know of a money-saving tip or trick I've overlooked, please share it with me for future publication. In the meantime, happy computing. **m**

Send nominees for sainthood to *Service Heroes, Macworld*, 501 Second St., San Francisco, CA 94107, or via AppleLink (Macworld1) or America Online (Branscum). Conversely, drop *Conspicuous Consumer* a line if a company is ignoring you.

Editors' Choice

THE BEST PRODUCTS FEATURED IN MACWORLD

Edited by Susan Grant-Marsh

Macworld Editors' Choice is a complete listing of the hardware and software products selected as the best of their type in *Macworld*'s comparative articles through the past year. A ✣ next to a product indicates that we chose more than one product in that category.

Hardware

MONITORS

BLACK-AND-WHITE MONITORS, May 93
Portrait monitor: 15-Inch Gray Scale Portrait Display; Mirror Technologies, 612/633-4450; $399, with video-display board $549
Two-page monitor: ✣ L-View MultiMode; Sigma Designs, 510/770-0100; $1099, with video-display board $1398 ✣ MD 202 Two Page Display; Mobius Technologies, 510/654-0556; $699, with video-display board $798.

COLOR MONITORS, Oct 93
16- and 17-inch: ✣ ErgoView 17; Sigma Designs, 510/770-0100; $1349
✣ MultiSync 5FG; NEC Technologies, 708/860-9500; $1355 (NEC's estimated dealer price).

GRAY-SCALE MONITORS, May 93
Portrait monitor: Pivot Display; Radius, 408/434-1010; $849, with video-display board $1148.
Two-page monitor: MultiMode 120, SilverView Pro; Sigma Designs, 510/770-0100; $1099, with video-display board $1299

SMALL COLOR MONITORS, Jan 94
14-inch display: ✣ Sony CPD 1430; Sony Corp. of America, 800/222-7669; $779.95. ✣ Nanao FlexScan F340i•W; Nanao USA, 800/800-5202; $799.
15-inch display: NEC MultiSync 4FGe, NEC Technologies, 708/860-9500; estimated street price $755.

NETWORK HARDWARE

HARDWARE ROUTERS, Jul 93
Under $1500: EtherRoute; Compatible Systems, 303/444-9532 base model $1495 (no TCP/IP support).
Between $1500 and $3500: InterRoute/5; Farallon Computing, 510/814-5000; $3299 to $3499

HIGH-SPEED FAX MODEMS, Oct 93
Teleport Gold and Silver with Global Fax; Global Village Communication, 415/390-8200, Gold $499, Silver $429

POWERBOOK TOOLS

DUO DOCKING CONNECTORS, Feb 93
PowerLink DeskNet; E-Machines, 503/646-6699; $699.

EXTERNAL HARD DRIVES, Feb 93
✣ Companion 120; APS Technologies, 800/874-1428; $599. ✣ PocketDrive 120MB; La Cie, 503/520-9000; $699.

INTERNAL FAX MODEMS, Feb 93
✣ PowerModem series; PSI, 408/559-8544; $195 to $495. ✣ PowerPort series; Global Village Communication, 415/390-8200; $229 to $499.

PRINTERS

COLOR PRINTERS, May 93
Dye-sublimation: ✣ ColorStream/DS; Mitsubishi International, 408/980-1100; $9950. ✣ Phaser IISD Color Printer; Tektronix, 503/682-7377; $9995.
Thermal-wax: ✣ ColorScript 210; QMS, 205/633-4300; $4995. ✣ Personal ColorPoint PSE; Seiko Instruments, 408/922-5800; $2999.
Low-end liquid-ink: HP DeskWriter 550C; Hewlett-Packard, 800/752-0900; $1099.
Midrange liquid-ink: HP PaintJet XL300; Hewlett-Packard, 800/752-0900; $3495.
Solid-ink: Phaser III PXi Color Printer; Tektronix, 503/685-3585; $9995.

PERSONAL PRINTERS, Sep 93
Ink-jet: StyleWriter II; Apple Computer, 408/996-1010; $359.
PostScript laser: TI microLaser Series; Texas Instruments, 512/250-6679; $1199 to $1599
QuickDraw laser: LaserWriter Select 300; Apple Computer, 408/996-1010; $839.

WORKGROUP PRINTERS, Feb 94
High-speed: Hewlett-Packard 4Si MX; Hewlett-Packard, 800/752-0900; $5499.
Best buy: ✣ Apple LaserWriter Pro 630; Apple Computer, 408/996-1010; $2529 ✣ Hewlett-Packard LaserJet 4M, Hewlett-Packard, 800/752-0900; $2329

SCANNERS

LOW-COST COLOR SCANNERS, Nov 93
$1300 to $1600: ✣ La Cie Silverscanner II; La Cie, 503/520-9000; $1599 ✣ Hewlett-Packard ScanJet IIc, Hewlett-Packard, 800/752-0900; $1599
Under $1300: Mirror 800 Plus Color Scanner; Mirror Technologies, 612/633-4550; $1299

OCR, Nov 93
OmniPage Professional; Caere Corp., 408/395-7000; $995.

SYSTEMS/STORAGE

DOUBLE-SPEED CD-ROM DRIVES, Jul 93
Sheer speed: Pioneer DRM-604X; Pioneer, 408/988-1702; $1795.
Overall value: AppleCD 300; Apple Computer, 408/996-1010; $599.
Budget choice: NEC MultiSpin 38; NEC Technologies, 708/860-9500; $465.

HIGH-SPEED HARD DRIVES, Aug 93
2.7GB drives: ✣ Nova XL 2700; Microtech International, 203/468-6223; $2999. ✣ Vista 3.5G8; Relax Technology, 510/471-6112; $3499.
SCSI-2 adapter: QuickSCSI; PLI, 800/288-8754, $499.

MACINTOSH UPGRADES, Jun 93
Classic accelerator (40MHz): TransWarp Classic; Applied Engineering, 214/241-6060; $798 (with FPU)
SE accelerator (50MHz): Gemini Integra; Total Systems, 503/345-7395; $1089 (with FPU).
SE accelerator (25MHz): Quik30; Novy Systems, 904/427-2358; $449 (without FPU)
SE/30 accelerator (50MHz or 33MHz): Universal PowerCache; DayStar Digital, 404/967-2077; 50MHz $999 (with FPU), 33MHz $449 (without FPU).
LC and LC II upgrades: Macintosh LC III Logic Board Upgrade; Apple Computer, 408/996-1010; $599
Mac II accelerators: ✣ Radius Rocket 25i, Radius Rocket 33; Radius, 408/434-1010; 25i $1199, 33 $2499 ✣ Universal PowerCache series; DayStar Digital, 404/967-2077; $449 to $999.
IIfx SCSI accelerator: QuickSCSI, PLI, 800/288-8754; $499.
Quadra static-RAM cache card: FastCache Quadra; DayStar Digital, 404/967-2077; $299 for Quadra 700 and 900, $449 for Quadra 800 and 950.

MIDRANGE HARD DRIVES, Mar 93
Low-capacity drive: La Cie Cirrus 240; La Cie, 503/520-9000; $769
Notable technology: DiamondDrive 510; Mass Microsystems, 408/522-1200, $2089
Bargain: APS Fujitsu 520, APS Technologies, 800/874-1428, $1149
All-around quality: hammer 525FMF, FWB, 415/474-8055, $2799.

OPTICAL DRIVES, Dec 93
3½-inch: ✣ Epson OMD 5010, ClubMac 800/258-2622

continues

MACWORLD Editors' Choice

$959. ✣ 128 MO; APS Technologies, 800/874-1428; $899.
5¼-inch: ✣ Sharp JY-750; ClubMac, 800/258-2622; $1829. ✣ Infinity MaxOptical 11m; PLI, 800/288-8754; $4113.

VIDEO/DISPLAY

24-BIT VIDEO CARDS, Apr 94
Inexpensive acceleration: PrecisionColorPro 24XP; Radius, 408/434-1010; $599.
Full-featured acceleration: Thunder II GX•1360; SuperMac Technology, 408/541-6100; $4499.

COLOR LCD PROJECTION, Jan 93
Display panel: MediaPro; nView Corp., 804/873-1354; $7995.
Low-end panel: TFT Rainbow HD Model 700; Chisolm, 408/559-1111; $5295.
Complete LCD projector: System 6000; In Focus Systems, 503/692-4968; $8495.

PHOTOSHOP ACCELERATORS, Apr 94
PhotoBooster; Radius, 408/434-1010; $999.

VIDEO-CAPTURE BOARD, Jan 93
VideoSpigot; SuperMac Technology, 408/541-6100; $449 to $1399, depending on bundling options.

Software

ACCOUNTING/FINANCE

GROWING A SMALL BUSINESS, Nov 93
Small-business system: M.Y.O.B.; Teleware, 201/586-2200; $199.
Home office/personal finance: MacMoney; Survivor Software, 310/410-9527; $119.95.

PERSONAL FINANCE, Jun 93
✣ CheckWriter 4.0; Aatrix Software, 701/746-6801; $79.
✣ Andrew Tobias' Managing Your Money 5.0; MECA Software, 203/256-5000; $79.95.

BUSINESS TOOLS

STATISTICS, Oct 93
Exploratory data analysis: DataDesk 4.1; Data Description, 607/257-1000; $595.
Comprehensive package: SYSTAT 5.2.1; SYSTAT, 708/864-5670; $895.

CD-ROM

TOP 10 CD-ROMS, Mar 94
Overall: Seven Days in August; Time Warner Interactive Group, 818/955-9999; $79.99.

COMMUNICATIONS/NETWORKS

HIGH-SPEED FAX MODEM SOFTWARE, Oct 93
Faxstf; Telefocus, 816/886-9800; $79.

NETWARE CONNECTIVITY, Sep 93
NetWare for Macintosh; Novell, 801/429-7000; $495 for 5-user license to $2295 for 200-user license.

SOFTWARE ROUTER, Jul 93
Apple Internet Router 3.0; Apple Computer, 408/996-1010; Basic Connectivity Package $499.

TERMINAL EMULATOR, Oct 93
VersaTerm; Synergy Software, 215/779-0522; $149.

GRAPHICS

2-D CAD, Jan 93
Low-end: BluePrint; Graphsoft, 410/461-9488; $295.
Midrange: PowerDraw; Engineered Software, 919/299-4843; $795.

3-D DESIGN, Aug 93
Price for performance: ✣ Ray Dream Designer 2.0.4; Ray Dream, 415/960-0765; $299. ✣ Alias Sketch 1.5; Alias Research, 416/362-9181; $995.
All-in-one solution: ✣ Infini-D 2.5; Specular International, 413/549-7600; $995. ✣ StrataVision 3D 2.6.1; Strata, 801/628-5218; $995.

CLIP ART'S GREATEST HITS, Jan 94
Overall collection: ✣ ClickArt Studio Series; T/Maker Company, 415/962-0195; $99.95 per volume. ✣ Electronic Clipper subscription service; Dynamic Graphics, 800/255-8800; $67.50 per month. ✣ Metro ImageBase Electronic Clip Art; Metro ImageBase, 800/525-1552; $74.95 per volume, CD-ROM $149.95. ✣ Images with Impact series; 3G Graphics, 800/456-0234; $99.95 to $129.95 per volume, CD-ROM $499. ✣ Typographers' Ornaments; Underground Grammarian, 609/589-6477; $25 per volume; ten TIFF albums $200; EPS volumes $50 each.

DRAW PROGRAMS (LOW-COST), Sep 93
Budget draw: Expert Draw; Expert Software, 305/567-9990; $49.95.
Budget draw/paint: UltraPaint; Deneba Software, 305/596-5644; $79.
Beginners' program: Aldus SuperPaint; Aldus Corp., 619/558-6000; $149.95.
Overall: Canvas; Deneba Software, 305/596-5644; $399.

FONT BUYERS' GUIDE, Mar 94
Text-face collection: Type On Call CD-ROM; Adobe Systems, 415/961-4400, 800/682-3623; $99 (includes the ability to unlock two families from preselected packages) plus $25 to unlock individual faces or $69 to $179 for unlocking families.
Display/decorative-face collection: Fontek; Letraset, 201/845-6100; $39.95 per face.
Bargain collection: Monotype ValuePack; Monotype, 312/855-1440; $89 for 57 fonts.

Vendors: Please write to Macworld Editors' Choice, 501 Second St., San Francisco, CA 94107, or send a fax to 415/442-0766 to inform us of changes in your phone number or your product's list price.

IMAGE DATABASES, Oct 93
✣ Aldus Fetch 1.0; Aldus Corp., 206/628-5739; $295.
✣ Multi-Ad Search 2.0; Multi-Ad Services, 309/692-1530; $249.

PAINT AND IMAGE-EDITING, Sep 93
Budget buy: Expert Color Paint; Expert Software, 305/567-9990; $49.95.
Overall program: Fractal Design Painter; Fractal Design Corp., 408/688-8800; $399.
Image-editing program: Adobe Photoshop 2.5.1; Adobe Systems, 415/961-4400; $895.

INTEGRATED SOFTWARE

INTEGRATED SOFTWARE, Feb 94
ClarisWorks; Claris Corporation, 408/727-8227; $299.

ORGANIZATION/PRODUCTIVITY

CALENDARS, Jul 93
Alarm system: ✣ First Things First; Visionary Software, 503/246-6200; $79.95.
✣ Smart Alarms Plus; JAM Software, 203/630-0055; $75.
All-around scheduler: Now Up-to-Date; Now Software, 503/274-2800; $99.
Meeting scheduler: Meeting Maker; On Technology, 617/374-1400; five-pack $495.

SALES-AUTOMATION SOFTWARE, Oct 93
✣ Contact Ease; WestWare, 619/660-0356; one user $395, five users $1495.
✣ CBS; Colleague Business Software, 512/345-9964; $495.

TEXT-RETRIEVAL SOFTWARE, Dec 93
Small system: On Location; On Technology, 617/374-1400; $129.
Multiuser system: Personal Librarian; Personal Library Software, 301/990-1155; $995.

PRESENTATION TOOLS

MULTIMEDIA AUTHORING, Mar 93
Entry-level: ✣ Action; Macromedia, 415/252-2000; $495. ✣ Passport Producer; Passport Designs, 415/726-0280; $495.

UTILITIES

BRAVE NEW DOCUMENTS, Jan 94
Application-independent document distribution: Common Ground; No Hands Software, 800/598-3821; $189.95.
Book-length documents: FrameReader; Frame Technology, 800/843-7263; $84.95.

PRINTING, Sep 93
PC-printer cable packages: PowerPrint; GDT Softworks, 604/291-9121; $149. m

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Star Ratings

OVER 350 HARDWARE AND SOFTWARE REVIEWS AT A GLANCE

Edited by Wendy Sharp

Macworld Star Ratings lets you compare hardware and software products for the Macintosh by providing summaries of hundreds of *Macworld*'s authoritative product reviews. The number of stars at the beginning of each capsule review indicates quality; our reviewers assign five stars to outstanding products and one star to poor ones.

If a product has been upgraded since our last review, the most recent version number supplied by the vendor appears in parentheses after the reviewed version number. To read a full review of any product in the listing, please consult the issue listed at the end of each synopsis.

Vendors: Please write to *Macworld Star Ratings*, 501 Second St., San Francisco, CA 94107, to inform us of changes in the version number or list price of your product, or of changes to your phone number.

Software

BUSINESS TOOLS

★★★ **4D Server 1.0.1 (1.0.5), ACI US, 408/252-4444, $1495 to $3495.** Database server uses the ingenious multitasking technology built into 4th Dimension to make it appear that each client has the full resources of the server. If you use 4D on a network, you need this product. Jun 93

★★★★ **4th Dimension 3.0.1 (3.0.5), ACI US, 408/252-4444, $895.** Multitasking, which greatly improves speed, makes this upgraded relational database delightful for both developers and end users. For a relational database, it's impressively easy to use. Apr 93

★★ **AccuZip6 1.5.2 (1.8.5), Software Publishers, 800/233-0555, $689.** Professional-level mail-list-management tool on CD-ROM is the most comprehensive system available, but its inexcusable user-interface violations make our reviewer reluctant to recommend it. May 93

★★★ **Acrobat Exchange, Acrobat Distiller, Adobe Systems, 415/961-4400, $195 to $2495.** Complete, well-planned paperless office system creates application-independent viewable files that can be readily distributed on a network. Still, it's not yet as inexpensive or as convenient as you might wish. Oct 93

★★★ **@Risk 1.1, Palisade Corp., 607/277-8000, $395.** Statistical simulator for Microsoft Excel financial computations generates complex, statistically valid templates within Excel and is the first choice for analysts who work with probabilistic models every day. It assumes that the user is an Excel power user. Aug 93

★★★★ **ClarisWorks 2.0, Claris Corp., 408/727-8227, $299.** Integrated program provides more features, is easier to use and faster, and has better integration among modules than other available programs. Aug 93

★★★★ **Common Ground 1.0, No Hands Software, 415/802-5800, $189.95.** Simple, robust document-interchange system is the clear choice for modest document-distribution jobs. In tests, it worked easily with documents from many different applications. Oct 93

★★ **EasyFlow 1.1, HavenTree Software, 613/544-6035, $229.** The rough edges and distinctly un-Mac-like attributes of this flowcharting software reflect its DOS heritage, but on the whole it's easy to use. Sep 93

★★★ **Helix Express 1.0 (2.0), Helix Technologies, 708/465-0242, $439.** This relational database has an iconic programming language that sometimes baffles programmers, but provides an easy route into basic data-handling for nonprogrammers. Jul 93

★★★ **Helix Tracker 1.0, Helix Technologies, 708/465-0242, $439.** Well-designed workgroup-document manager has strong audit and annotation features; imposes just the right amount of administrative discipline. For large documents, however, Ethernet will look mighty attractive. Nov 93

★★★ **ithink 2.2.1, High Performance Systems, 603/643-9636, $695.** Although it requires a real training commitment for effective use, this product is an attractive dynamic business modeling system. It's a good bet for identifying cloudy spots in the crystal ball. May 93

★★ **Lotus Notes 3.0, Lotus Development Corp., 617/577-8500, $495 per client.** Well-organized, robust, and flexible business data system demands a full-time administrator, preferably with considerable programming experience, for effective use. Sep 93

★★★ **MacBarcoda 2.2.4, ComputaLabel, 508/462-0993, $349 to $895.** Simple-to-use desk accessory creates bar codes in EPS or Adobe Illustrator 1.1 format. DA cannot automatically create serial codes. Jun 93

★★★ **MacProject Pro 1.0 (1.5), Claris Corp., 408/727-8227, $599.** If you're working on a midsize project and like using PERT charts, this may be the project-management software for you. However, the multistep scheduling process and the limited integration between charts are frustrating if you prefer Gantt charts. May 93

★★★★ **MarcoPolo 2.0, Mainstay, 805/484-9400, $395.** Inexpensive, easy-to-use product allows you or your workgroup to archive and retrieve documents, whether in electronic or paper form. Queries are easy to construct and searches are handled quickly. Sep 93

★★★ **Market Master Manager 3.5, Breakthrough Productions, 916/265-0911, $395 to $1995.** Sales-automation software is designed to keep track of contacts, generate mailings, and make sure that leads don't fall through the cracks. It includes a remote module, but it has some odd user-interface features. Oct 93

★★ **Memorizer 2.0, Brains Software Engineering, 432-231-28973 (Austria), $100.** Software records dictation and you transcribe the dictation in a word processor. You may prefer to stick with a hand-held tape recorder, considering the product's RAM and storage appetite, and its propensity to crash. Aug 93

★★★ **Micro Planner Manager 1.1, Micro Planning International, 303/757-2216, $695.** When you require cross-project resource sharing and leveling for a reasonable price, this project-management software has the edge. It has a generally intuitive interface, though there's a steep learning curve for its advanced features. Nov 93

★★★ **Microsoft Works 3.0 (3.0a), Microsoft, 206/882-8088, $249.** Capable upgrade delivers marginally improved functionality and a welcome face-lift to this integrated program, but there are a number of incompatibilities, odd design choices, and performance flaws. Feb 93

★★★ **Office Tracker 1.1, Milum Corp., 512/327-2255, $195 to $995.** The efficient user interface of this software sign-out board, in both single-user and networkable versions, makes it easy to learn and use; but it has some minor flaws. Dec 93

★★★ **OrgChart Express 1.0, Kaetron Software, 713/298-1500, $199.** Organization-chart software links a database to standard box-drawing functions. Although the learning curve is steep, the effort may be worth it for people who regularly work with large or complex organization charts. Apr 93

★★★★ **Project Scheduler 5, Scitor Corp., 415/570-7700, $695.** For most midrange project-planning, this program's many hits outweigh its few misses. It goes beyond the requisite scheduling options, with inflation factors and unlimited projects in memory, and it conforms to accepted standards, so you get consistent, predictable results. Aug 93

★★ **Useful Voice Processor for Macintosh 1.1v7 (1.1v9), Useful Software Corp., 508/774-8233, $179.95.** Dictation software lets you record and transcribe on a Mac. It has some useful features, but you must take uncommon care to avoid crashes. Dec 93

★★★ **Wingz 1.1ae, Informix Software, 913/599-7100, $399.** Low-overhead spreadsheet offers advanced-math functionality, a competent calculating engine, and superior charts; but spreadsheet is missing outlining, real 3-D spreadsheet linking, and the host of third-party add-ons offered for Microsoft Excel. Jul 93

★★★ **WordPerfect Works 1.2, WordPerfect Corp., 801/225-5000, $249.** This program offers seven well-integrated and flexible modules. It has a few shortcomings, including some memory-management problems, but buyers should generally be pleased. Jun 93

continues

Star Ratings

COMMUNICATIONS/NETWORKS

★★★ **Delrina FaxPro for Macintosh 1.0, Delrina Corp., 408/363-2345, $129.** Fast, efficient fax software has an excellent address-book feature but also has some interface quirks and minor bugs. Feb 94

★★★★ **EtherPeek 2.0.3, LocalPeek 2.0.3, TokenPeek 1.0 (2.0.3), AG Group, 510/937-7900, $495 to $995.** Priced at a fraction of the cost of dedicated hardware analyzers, these network analyzer tools give you better analysis with a friendlier interface. They're a worthwhile investment. Jan 94

★★★★ **MicroPhone Pro, Software Ventures Corp., 510/644-3232, $295.** Truly comprehensive telecommunications package now includes send-and-receive fax software. Although the new TCP/IP tools are complicated, the documentation is clear and precise. Apr 93

★★★ **Network Vital Signs 1.0 (1.1), Dayna Communications, 801/269-7200, $449.** Fault-monitoring application continually watches selected network devices, monitoring for specific errors. Unfortunately, when monitoring more than ten devices, it noticeably degrades the performance of the monitoring Mac. Mar 93

★★★ **On The Air 1.0.1 (1.0.2), Digital Eclipse Software, 510/547-6101, $79.99 to $639.99.** Intercom system transmits System 7 SND resources, SoundEdit, and AIFF sound files across a network. It's well designed and performs decently, but its usefulness seems limited. Aug 93

★★★ **On The Road 1.1, Connectix, 415/571-5100, $99.** Helpful PowerBook utility looks at what's hooked up to your computer and adjusts accordingly—for example, printing when a printer is available and otherwise deferring printing. It only supports some hardware, however, so check before buying. Dec 93

★★★★ **Silver Cloud 1.2, AG Group, 510/937-7900, $495.** If you are administrating a large network and are drowning in a sea of devices and zones, this network-management software will make your life simpler. Feb 94

★★ **SoftPC 3.1, Insignia Solutions, 415/694-7600, $499.** While the speed of this Windows PC emulator is greatly improved, buying an add-in PC card for your Mac is more efficient. Mar 94

★★★★ **Timbuktu 5.0.1, Farallon Computing, 510/814-5000, $199 to $5500.** By letting one computer (a Mac or a Windows-based PC) control, observe, or exchange data with another computer, this terminal-emulation product allows you to use resources almost anywhere on a network. Mar 93

★★★★ **VersaTerm 5.0, Synergy Software, 215/779-0522, $195.** The price and feature set of this network terminal-emulation package make it a terrific value, in spite of its complex documentation and limitations. If you're looking for a fast path to Internet connectivity, this is it. Jan 94

DESKTOP PUBLISHING

★ **AboutFace 1.1.1 (1.1.2), Big Rock Software, 716/288-2860, $69.95.** Type-specimen generator has many serious deficiencies that need to be addressed. Jan 94

★★★★ **Aldus Fetch 1.0, Aldus Corp., 206/622-5500, $295.** The rich feature set and network support of this image-cataloging software make it a clear winner. Although cataloging is slow, users have fine control of the depth and compression of thumbnails. Aug 93

★★★★ **Aldus PageMaker 5.0, Aldus Corp., 206/622-5500, $895.** Desktop publishing software has added the features, both great and small, that it's been lacking, while still retaining the ease-of-use advantages that it's always had. This is a superb upgrade. Nov 93

★★ **Aldus Personal Press 2.0, Aldus Corp., 206/628-2320, $199.** Basic, inexpensive page-layout program gains strength, but is still missing elements that novice users need, such as automatic kerning. Its software-knows-best approach to copyfitting makes manual fine-tuning difficult and is likely to confuse beginners. Mar 93

★★★ **Apple Font Pack, Apple Computer, 408/996-1010, $99.** Apple's first collection of TrueType fonts includes only 12 fonts that haven't been available since the late eighties in the PostScript format. Still, it's not a bad deal, considering that Adobe PostScript fonts cost four times as much. Mar 93

★★★ **Cumulus 1.1 (1.2), Canto Software, 415/431-6871, $295 to $895.** Good network support, plus a feature that creates a protocol file for recording user actions, make this image-cataloging program a good choice for workgroups. It doesn't have an image-preview feature, nor does it offer 32-bit thumbnails. Aug 93

★★★ **Expanded Book Toolkit 1.0.1 (2.1), The Voyager Company, 310/451-1383, $295.** Using this hypermedia publishing program, average mortals can create highly functional multimedia books in a fraction of the time it would take to do the job unassisted. Be aware, though, that it's no QuarkXPress. Jun 93

★★★★ **FontMonger 1.5.7, Ares Software Corp., 415/578-9090, $149.95.** Font-conversion utility provides cross-platform, cross-font conversion and makes it easy to create composite, subscript, superscript, and rotated characters. Sep 93

★★★★ **FrameMaker 4.0, Frame Technology Corp., 408/433-3311, $895.** For such projects as long, structured documents—books, instruction manuals, and textbooks—this desktop publishing program is one of the best tools available. It's fast, well mannered, and a real time-saver. Mar 94

★★ **ImageAccess 1.0, Nikon, 516/547-4355, $495.** This expensive image-cataloging program has an unusual interface and cannot be used over a network. A plug-in module provides direct support for Nikon's LS-3510AF film scanner. Aug 93

★★★ **Kodak ColorSense 1.0, Eastman Kodak, 716/253-0740, $499.** Color-management system gives average users access to a reasonable level of color consistency at a reasonable price. It does not make color separations. Oct 93

★★ **Kudo Image Browser 1.0 (1.1), Imspace Systems Corp., 619/272-2600, $195.** This image-cataloging software cannot control thumbnail depth or compression, and it does not have a keyword feature or allow multiple users to access the catalog simultaneously. The unique Riffle feature lets you quickly scan images. Aug 93

★★★ **Lazy Dog Foundry Personal Font, Lazy Dog Foundry, 612/291-0306, $199.99 to $499.99.** Type 1 font made from your handwriting has clean, even lines—whether or not your writing does. Apr 93

★★★ **Publish It Easy 3.0 (3.02), Timeworks, 708/559-1300, $199.95.** Desktop-publishing program offers writing, editing, formatting, page-layout, drawing, and painting tools with well-thought-out interface innovations, plus an excellent database manager. Unfortunately, the program is unstable and crash-prone. Mar 93

★★★★ **QuarkXPress 3.2, Quark, 303/894-8888, $895.** This upgrade adds the EfiColor XTension to ensure the greatest possible fidelity of color images and is a must-have for professional color publishers who use QuarkXPress. For others, the enhancements are welcome but insignificant enough that they provide little incentive to upgrade. Nov 93

★★★★ **SuperATM, Adobe Systems, 415/961-4400, $149.** This upgrade to Adobe Type Manager lets you view Adobe-brand PostScript fonts on screen and output them at high resolutions, even when the corresponding printer fonts are unavailable. Although it has limitations, this is an outstanding advance in font technology and a tremendous value. May 93

★★★★ **Tableworks Plus 1.05, Npath, 206/392-7745, $299.** Publishing utility adds a full table-editor to QuarkXPress and is a must-have for anyone doing even mildly complex tables. Jan 94

EDUCATION

★★★★ **Algebra 1.0, Broderbund Software, 415/382-4400, $69.95.** Interactive, imaginative math tutorial is keyed to the standard textbook order of topics, but offers much more. It is particularly strong on word problems and graphing. May 93

★★ **Comprehensive Review in Biology, Queue, 203/335-0908, $295.** There isn't a textbook publisher in North America with the nerve to publish a black-and-white biology book with nothing more than text and basic line drawings, much less charge several hundred dollars for it, but that, in effect, is what this CD-ROM is. May 93

★★★ **Compton's Multimedia Encyclopedia 1.00M, Compton's New Media, 619/929-2626, $795.** The down-to-earth writing style and numerous bells and whistles of this multimedia encyclopedia on CD-ROM appeal to younger readers, but the high cost and sluggish performance may be prohibitive. Apr 93

★★★★ **Decimal & Fraction Maze 1.2 (1.2.3), Great Wave Software, 408/438-1990, $69.95 to $89.95.** Education software weaves the threads of eight math curricula—from third grade to eighth, along with two levels of adult education—into an interesting and visually stimulating game. Jul 93

★★ **Dvorak on Typing 1.0, MacPlay, 714/553-3530, $49.95.** Typing tutor offers solid lessons, but the small annoyances, such as never being able to take intermediate or advanced lessons without first passing a test, add up. Jun 93

★★★★ **How Computers Work, Time Warner Interactive Group, 818/955-9999, $79.99.** Graceful, well-integrated CD-ROM tutorial guides the curious through brief but helpful explanations of basic computer technologies. Jan 94

★★★ **HyperStudio, Roger Wagner Publishing, 619/442-0522, $179.95.** Hypermedia authoring tool supports color and many multimedia functions through easy-to-use dialog boxes, but the interface doesn't always follow Apple guidelines. Dec 93

★★★★ **Mavis Beacon Teaches Typing 2.0, The Software Toolworks, 415/883-3000, $49.95.** If being entertained while learning to type interests you, this typing tutor provides varied environments, interesting lessons, and good games. Jun 93

★★★ **Millie's Math House 1.0 (1.1), Edmark Corp., 206/556-8400, $49.95.** Math-education software provides ways for preschoolers to experiment with numbers and counting. It's engaging, but more-advanced levels would keep children challenged longer. Jul 93

★★★★ **The New Grolier Multimedia Encyclopedia, Grolier Electronic Publishing, 203/797-3530, $395.** The scholarly text of this encyclope-

dia on CD-ROM is suitable for sophisticated readers, while its speed, ease of use, and value are impressive. Apr 93

★★★★ **The Rosetta Stone, Fairfield Language Technologies, 703/432-6166, $395.** Foreign-language instruction on CD-ROM is a valuable educational tool and fun to use. The lessons are well paced, and the content is generally excellent and diverse. Jan 94

★★ **The Secret Codes of C.Y.P.H.E.R. 1.0 (1.1.1), Tanager Software Productions, 510/430-0900, $59.95.** Intriguing facts about mammals and a variety of alphabets provide the interest in this educational game, but the inescapable, repetitive animations are a major detraction. Apr 93

★★★ **The Secret Island of Dr. Quandary 1.0, MECC, 612/569-1500, $49.95.** Clever package of gorgeous landscapes, catchy sounds, and tempting arcade-game puzzles uses math, logic, and reading skills. Although slow, it's fun for parents and kids. Jun 93

★★★ **Stickybear's Reading Room 2.2a, Optimum Resource, 803/785-7441, $59.95.** Educational game with four activities takes a sedate but direct path to building primary-level reading skills. Jun 93

★★★★ **Where in America's Past Is Carmen Sandiego? 1.0, Broderbund Software, 415/382-4400, $34.95.** Travel in time and the U.S. chasing those V.I.L.E. crooks in this clever educational history/geography game that's challenging for all ages. Mar 93

ENTERTAINMENT

★★★★ **A-Train, Maxis, 510/254-9700, $69.95.** Charming railroad simulation offers astonishing, and often witty detail, but the learning curve is high and the interface isn't completely Mac-like. Apr 93

★★ **America Alive, MediaAlive/CD Technology, 408/752-8500, $99.** QuickTime movies, photographs, maps, text, and audio mingle in this multimedia CD-ROM guide to the United States. It's a promising concept, but it doesn't yield much useful information. Mar 93

★★★★★ **Arthur's Teacher Trouble 1.0, Broderbund Software, 415/382-4400, $39.95.** Every page of this delightful animated storybook is dense with surprises that arouse and satisfy a child's curiosity. In the words of six-year-old Alex, "It's like chocolate ice cream. You can have it more than once and it's still good." Apr 93

★★★ **Battle Enhanced Chess CD ROM (Rev 7), Interplay Productions, 714/553-6678, $64.95.** Elaborately detailed cartoon characters act out little dramas of strategy and capture, complete with sound effects, in this chess game that will drive nine-year-olds mad with glee but may annoy some experienced chess players. Mar 93

★★★ **BlackJack Trainer, ConJelCo, 412/492-9210, $75.** Learn the strategies you need to win at blackjack with this program. There are a number of trivial bugs, but they won't get in the way. Oct 93

★★★ **Cogito 1.0 (1.04), Inline Software, 203/435-4995, $59.95.** Rubik's Cube fans will like this challenging game where the goal is to replicate a pattern by moving rows and columns of tiles. It gets more and more complex as you progress through the 120 levels. Apr 93

★★★ **Daily Sports Quiz 1.0, DreamTime, 619/236-1341, $49.95.** If you think you know a lot about sports and love to play trivia games, then this entertaining and informative game is for you. Oct 93

★★★★ **Falcon MC 1.0, Spectrum HoloByte, 510/522-1164, $69.95.** Whether you're an armchair jet jockey or an experienced fighter pilot, you're bound to be impressed by the 4-bit color, enhanced graphics, and sophistication of this latest incarnation of the original Macintosh combat flight simulator. Dec 93

★★★ **Hell Cab 1.0.1, Time Warner Interactive Group, 818/955-9999, $99.99.** Take a diabolical New York cabbie with a penchant for time travel, toss in the Empire State Building, add a few brainteasers, and you've got this engaging game on CD-ROM. It's slow and the arcade sections are hard to control, but overall it succeeds. Jan 94

★★★★ **Hellcats Over the Pacific 1.0.3, Graphic Simulations, 214/699-7400, $69.95.** Fly a WWII-era Navy fighter, the Grumman F6F Hellcat, against enemy planes in the South Pacific with this flight simulator that offers smooth graphics, good special effects, and great documentation. Apr 93

★★★ **Indiana Jones and the Fate of Atlantis, LucasArts Games, 415/721-3394, $59.95.** In this game, the whip-wielding archaeologist goes looking for Atlantis and finds it armed to the gills with magical technology and Nazi stooges. If you're not bothered by the story's astonishing sexism, you'll find it diverting. Oct 93

★★★★ **Jewelbox 1.5 (2.0), Varcon Systems, 619/563-6700, $49.95.** This gem of a game is strongly reminiscent of Tetris. The jewels fall into rows that disappear when you place three jewels of a kind together. Jun 93

★★★ **The Journeyman Project 1.0 (1.2), Presto Studios, 619/689-4895, $79.95.** Interactive science-fiction epic on CD-ROM is a work of art. The scenes are rich with painstakingly detailed graphics, elaborate models, and subtle textures, but the sluggish pace may leave you impatient and bored. Sep 93

★★★★ **Maelstrom 1.03, Ambrosia, P.O. Box 23140, Rochester, NY 14692-3140, $15 plus $5 shipping and handling.** Fast-paced arcade game is loosely modeled after Asteroids, the Atari classic. Maelstrom features superb animation, hilarious sound effects, exciting action—and best of all, it's shareware. Jun 93

★★★★ **Monkey Island 2: LeChuck's Revenge, LucasArts Games, 415/721-3394, $59.95.** This whimsical Twilight Zone of life on the sea is the adventure-game equivalent of *Mad* magazine, filled with splendid gross-out jokes, heapings of self-parody, and enough hilarious detail to keep you amused for days. May 93

★★★ **Mozart: The "Dissonant" Quartet, The Voyager Company, 310/451-1383, $59.95.** CD-ROM includes an unusual essay on stringed instruments, discussions of general musical concepts, an analytical overview of the quartet, and a taped minilecture on Mozart; but the music is limited almost entirely to the title piece. Apr 93

★★★★ **Myst 1.0, Broderbund Software, 415/382-4400, $59.95.** The smooth pacing of actions and sounds in this beautiful CD-ROM game give it a dreamlike quality. This is a game that's been polished until it shines. Mar 94

★★ **The Orchestra: The Instruments Revealed, Time Warner Interactive Group, 818/955-9999, $79.99.** The many-branched, interwoven, hypertext style of this music-education CD-ROM makes it hard to navigate and digest, despite its richness. For the price, other music-education CD-ROMs present better values. Apr 93

★★★★ **Richard Strauss: Three Tone Poems, The Voyager Company, 310/451-1383, $59.95.** *Don Juan*, *Till Eulenspiegel*, and *Death and Transfiguration* are included in this CD-ROM. The musical analysis is satisfying, and the lush orchestral music will appeal to both novice and experienced classical music listeners. Apr 93

★★★ **Rodney's Wonder Window, The Voyager Company, 310/461-1383, $39.95.** Collection of 23 colorful, wacky graphics and animations by Rodney Alan Greenblat is charming but uneven. While some modules are elaborate and sophisticated, others are simple and not particularly interesting. Mar 93

★★★ **Schubert: "The Trout" Quintet, The Voyager Company, 310/451-1383, $59.95.** Alan Rich, classical music commentator for NPR, conveys his enthusiasm for this appealing music in this CD-ROM's lively text. The discussion is relatively unchallenging, and the musical performance is not at the top of most reviewers' lists. Apr 93

★★★★ **Seven Days in August, Time Warner Interactive Group, 818/955-9999, $59.99.** Compelling, interactive documentary on CD-ROM cuts a slice from history and offers August 10 through August 16, 1961, (the building of the Berlin Wall) to viewers in a way that truly evokes the period. Oct 93

★★★ **Sherlock Holmes, Consulting Detective, Volume II, Viacom New Media (formerly Icom Simulations), 708/520-4440, $69.95.** Match wits with the legendary detective by solving three difficult mysteries in this CD-ROM game. May 93

★★★ **Space Quest 1: Roger Wilco in the Sarien Encounter, Sierra Online, 209/683-8989, $19.95.** As Roger Wilco, starship janitor, you must defeat the evil Sariens in this adventure game where your head is more important than your hands. For most players the game will be easy to complete. Apr 93

★★★★ **Spectre Supreme, Velocity Development, 415/274-8840, $69.95 to $89.95.** The pleasure of this game comes not in high scores, but in the almost addictive sense of control you get from moving your tank around the screen. It's so much fun that it's even fun when you lose. Dec 93

★★★ **Super Mines 1.0, Callisto Corp., 508/655-0707, $49.95.** You use logic to search a minefield without setting off mines in this fast-paced game that's easy to learn, but offers 84 levels for long playability. Apr 93

★★★ **V for Victory: Utah Beach, Three-Sixty Pacific, 408/879-9144, ext. 23, $69.95.** The post-D-Day conquest of Normandy is re-created in this game; its strength is the way it blends easy play with complicated strategy. Some bugs exist. Oct 93

★★★★ **Who Killed Sam Rupert, Creative Multimedia Corp., 503/241-4351, $39.99.** You're a police detective trying to solve the murder of a popular restaurateur in this interactive CD-ROM that exploits the full range of multimedia options and provides a wealth of clues and surprises to hold your interest. May 93

FINANCE/ACCOUNTING

★★ **Andrew Tobias' TaxCut for Macintosh, MECA Software, 203/256-5000, $79.95.** The occasionally awkward interface of this personal tax-preparation software doesn't follow every Mac standard, but the help system is very good. State versions are available for California and New York. May 93

★★★★ **BestBooks 1.0, Teleware, 201/586-2200, $99.** In a straightforward, unintimidating manner, this small-business accounting program integrates the standard bookkeeping functions of accounts receivable, accounts payable, and general ledger. Jul 93

★★★ **MacInTax 1992 (1993), ChipSoft, 619/453-8722, $39.95.** It's difficult to correct your errors when using this personal tax-preparation software, but it's easier than doing your taxes by hand. The display is attrac-

continues

Star Ratings

tive and the program supports electronic filing. May 93

★★★★ **Quicken 4, Intuit, 415/898-6095, $69.95.** Personal-finance software is powerful and easy to learn, even for a financial neophyte. Although slower than previous versions, 4.0 lives up to its promise of making financial chores easier and better organized. Nov 93

★★★ **WealthBuilder 2.0, Reality Technologies, 800/346-2024, $79.99.** Financial-planning software forces you to think about your money and helps you develop an investment plan. It's a good program for beginning investors, but more-sophisticated investors will want more-advanced features. May 93

GRAPHICS

★★★ **addDepth 1.0.2, Ray Dream, 415/960-0768, $179.** The purpose of this graphics program is to enhance the creation of 2-D images with 3-D effects. It's versatile, accommodating, and affordable, but working on complex images gets tedious because of the automatic application of styles. Aug 93

★★★ **Adobe Dimensions, Adobe Systems, 415/961-4400, $199.** This three-dimensional-effects utility may seem very limited, with white-only light and no surface texturing, but it's a ground-breaking product. It performs its 3-D illusions within the object-oriented, resolution-independent world of PostScript. Apr 93

★★★★ **Adobe Illustrator 5.0, Adobe Systems, 415/961-4400, $595.** The Mac's most dependable draw program has added enough new features to boggle the mind. It still can't import TIFF images, but it catches up with, and in some areas surpasses, the competition. Nov 93

★★★★ **Adobe Photoshop 2.5 (2.51), Adobe Systems, 415/961-4400, $895.** No graphics program is as universally loved as this one, but while this upgrade builds on the program's capabilities, it ignores some minor weaknesses that have begun to peek through the product's armor. It's still great but perhaps not perfect. Jun 93

★★★★ **Aldus FreeHand 4.0, Aldus Corp., 206/622-5500, $595.** The new page-design and text-editing functions of this powerful draw program make it more than worth the price of admission. Aside from some bewildering interface elements, it's an outstanding program. Mar 94

★★★★ **Alias Sketch 1.5, Alias Research, 416/362-9181, $995.** The enhanced modeling and revamped rendering capabilities of this 3-D illustration program contribute to a tremendous and reliable upgrade, a heartening example of a company listening to its users. Jul 93

★★ **ArtBeat Professional 1.0, Pie Practical Solutions, 201/902-9500, $249.** Despite a smattering of unique capabilities, this inexpensive draw/paint program lacks features of equivalent programs. Apr 93

★★★ **artWorks 1.0 (1.01), Deneba Software, 305/596-5644, $149.** If you're expecting a graphics dynamo, this combination paint and draw program will leave you a little cold. Despite its flaws, it ranks as one of the best graphics programs available under $200. Jun 93

★★★★ **Blueprint 4, Graphsoft, 410/290-5114, $295.** Entry-level 2-D drafting program is a wonderful antidote to the complicated CAD system blues. Don't be misled by the low price; this full-fledged drafting package is powerful enough to serve professionals who appreciate the value of simplicity. Jul 93

★★ **BrushStrokes 1.0, Claris Clear Choice, 408/727-8227, $139.** If you have absolutely no experience with computer graphics, the simplified interface of this 24-bit paint program might warrant its price. Otherwise, you can find better programs for less. Oct 93

★★★ **CA-Cricket Draw III 2.0 (2.01), Computer Associates International, 516/342-5224, $249.** This draw program is not going to inspire experienced Mac artists to jump up and down, but its features are abundant, the interface is straightforward, and the price is right. Oct 93

★★★ **Canvas 3.5, Deneba Software, 305/596-5644, $399.** Draw program offers two to three times as many features as any competing program, but our reviewer would prefer an interface that you can navigate without scrambling for the manual. Jan 94

★★★ **Color It 2.0.1, MicroFrontier, 800/388-8109, $299.95.** Overpriced color paint program has an ample range of painting and image-retouching capabilities, including 15 levels of undo and an impressive magic-wand tool, but its naming conventions are bewildering. Apr 93

★★ **ColorUp 1.0, Pantone, 201/935-5500, $99.95.** Professional graphic designers don't need the advice of this color tutorial and series of palettes. Although nonprofessionals might benefit from the information on color theory, it may not be worth the money. Nov 93

★★ **CPM Graphic Tutor 1 & 2, Caseys' Page Mill, 303/220-1463, $489 per volume.** Although some neophytes may find these CD-ROM tutorials on Adobe Illustrator and Adobe Photoshop helpful, the programs' distracting interfaces, inconsistent execution, lack of polish, and high price weigh strongly against them. May 93

★★★★ **DeBabelizer 1.5 (1.5.5), Equilibrium Technologies, 415/332-4343, $299.** Bitmapped-graphics-conversion software supports a huge number of file formats and can work wonders. If you spend any significant time dealing with file conversion, you should have this program. Nov 93

★ **Easy Color Paint 3.0, MECC, 612/569-1500, $59.95.** For a program that purports simplicity, this color paint program is anything but. Possibly the weakest, least intuitive paint program for the Mac, it's unnecessarily complex and frustrating. Jul 93

★★★★ **Electric Image Animation System 1.5.1 (1.6), Electric Image, 818/577-1627, $7495.** The most powerful animation program for the Mac improves its documentation and rendering, and adds an intuitive project window. Unfortunately, it still retails for the price of a European vacation for two. Feb 93

★★★ **Expert Draw 1.0, Expert Software, 305/567-9990, $49.95.** Inexpensive draw program is not really for experts, but it offers a decent, no-frills set of basic drawing tools and commands for beginning illustrators, office use, or anyone on a budget. Aug 93

★★★★ **Folio 1 Media Kit-Print Pro, D'Pix, 614/299-7192, $499.95.** Each image in this texture collection on three CD-ROMs provides a dynamic range of colors, highlights, and shadows; is free of artifacts; and is crisply focused. Aug 93

★★★★ **Fractal Design Painter 2.0, Fractal Design Corp., 408/688-8800, $399.** If you can put up with a few inconveniences, this color paint software provides the tools required by professional artists, and many of its functions—natural-media brush tools, the color-sensitive magic wand—are entirely without peer. Jul 93

★★★ **Generic CADD 2.0, Autodesk, 206/487-2233, $495.** Competent, midlevel 2-D drafting program has a well-executed Mac interface, a good complement of tools, and a sprinkling of high-end features, such as floating-point precision. Aug 93

★★ **Image Assistant 1.0, Caere Corp., 408/395-7000, $195.** Besides unsatisfactorily addressing Adobe Photoshop's small list of liabilities, this image-editing software's problems include an unforgivable lack of antialiased text, no selective revert function, and an incorrectly implemented smudge tool. Apr 93

★★★ **Infini-D 2.5.1, Specular International, 413/253-3100, $995.** Serviceable 3-D graphics program has a wide range of modeling, rendering, and animation options, with a straightforward interface and quick operating speed. If it weren't for the bloated price, it would be the ideal entry-level program. Feb 94

★★★★ **Kai's Power Tools Volume 1 1.0 (2.0), HSC Software, 310/392-8441, $149.** Although at times monstrously complicated, this collection of Photoshop plug-ins represents a virtually infinite supply of visual resources. It's an amazing tool that no regular Photoshop user should be without. May 93

★★★★ **MiniCAD+ 4, Graphsoft, 410/290-5114, $795.** Professionals will appreciate this highly competent CAD package's evolution into 3-D. It has maintained its features-champion status and is easier to use. Mar 93

★★★ **Ofoto 2.0 (2.02), Light Source Computer Images, 415/461-8000, $395.** Many new features—notably color support—have been added to the already impressive toolbox of this scanning software. It often produces good results, but it rarely produces the best scan possible for a given image and output method. Jul 93

★★★★ **Paint It 1.0, MicroFrontier, 800/388-8109, $59.95.** Straightforward color paint program lacks image-editing tools but has a versatile cast of selection and painting tools—and it's priced to sell. Apr 93

★★★★ **PosterWorks 3.0, S. H. Pierce & Co., 617/338-2222, $395.** This large-format graphics production tool is for people who think big, up to 10,000 square feet big. It fills the need for user-defined, full-color, large-format output robustly and elegantly. Aug 93

★★★★ **PowerDraw 4.0 (5.0), Engineered Software, 910/299-4843, $795.** The best new feature of this polished 2-D drafting program is an open architecture that supports modules that let you customize the program with application-specific tools, floating palettes, and menu commands. Sep 93

★★★★ **Sketcher 1.0, Fractal Design Corp., 408/688-8800, $79.** A variety of effects reproduce techniques of traditional drawing tools with this wonderful gray-scale paint and image processing program. Feb 93

★★ **StrataType 3d 1.0 (2.0), Strata, 801/628-5218, $199.** The rulers, texture palette, custom bevels, and canned positioning schemes of this 3-D type-effects software are nice, but they can't compare with the animation skills, lighting capabilities, and superb rendering of other available programs. Mar 93

★★★ **StrataVision 3d 2.6.3, Strata, 801/628-5218, $995.** 3-D program includes animation, and is a superior rendering tool and versatile modeler. It's a challenge to learn, however, as the interface is overly dense and sometimes sluggish. Feb 94

★★★★ **StudioPro 1.0, Strata, 801/628-5218, $1495.** If you need a well-balanced, all-in-one 3-D modeling, rendering, and animation solution, this application is an excellent choice. Mar 94

★★★ **Transverter Pro 1.0 (1.51), TechPool, 216/291-1922, $395.** Remarkable graphics-conversion software can read PostScript files and convert them to a variety of bitmapped and object-oriented formats. As you might expect of a program attempting to fill such a tall order, its conversions are not always flawless, but it can be a lifesaver nonetheless. Nov 93

★★★ **Tree, Onyx Computing, 617/876-3876, $295.** Single-purpose program generates lifelike color drawings of trees from a number of easily controlled parameters.

Although visually appealing, it's an expensive way to draw a tree. May 93

★★★ **upFront 2.0, Alias Research, 416/362-9181, $299.** Capable modeler is something of an acquired taste. However, take the time to learn it and you'll find useful, if unconventional and demanding, tools that are well suited for architectural modeling. Jan 94

★★★ **Virtus WalkThrough 1.1, Virtus Corp., 919/467-9700, $195.** Interactive 3-D modeling tool provides instantaneous access to rendered 3-D scenes, allowing you to travel through models at will. While it has some problems (such as occasionally just quitting), it's an excellent value. Jul 93

★★★ **Wraptures One, Wraptures Two, Form and Function, 619/536-9999, $95 each.** The images in these texture collections on CD-ROM are generally acceptable, although some are muddy and others are difficult to decipher at low resolutions. If you need images for repeating patterns, however, these repeat seamlessly and are a good value. Aug 93

MATH/SCIENCE

★★★ **Alchemy III, Tripos Associates, 314/647-1099, $950.** Molecular-modeling software can model decapeptides and DNA fragments, in addition to the expected small molecules, with refreshing alacrity on a Mac IIci or better. Sep 93

★★★ **Amazing Universe 2.1 (2.1a), Hopkins Technology, 612/931-9376, $79.95.** Space-image exploration package on CD-ROM offers an amazing variety of astronomical images with a very competent program (ProVision II) for modifying and inspecting those images. It assumes that users won't be fazed by such things as writing their own image-convolution matrices. Aug 93

★★★★ **CircuitMaker 3.0, MicroCode Engineering, 801/226-4470, $199.95.** Much of the tedium of diagramming circuits and constructing prototypes is relieved by this digital circuit simulator that provides a powerful set of basic tools for a very reasonable purchase price. Aug 93

★★★★ **C5C ChemOffice 2.0, Cambridge Scientific Computing, 617/491-6862, $995 to $1595.** Comprehensive chemistry software is the Mac equivalent of software that seven years ago would have cost $200,000 and required an equally costly minicomputer. It's a winner. Feb 94

★★★★ **Data Desk 4.0 (4.1), Data Description, 607/257-1000, $595.** For finding patterns in data, this statistical-analysis program has no peer. Years of refinement have made it a uniquely valuable tool, despite its lack of some tests found in larger programs. May 93

★★★★ **Expressionist 3.0 (3.1), Prescience Corp., 415/543-2252, $159.** If you work regularly on similar topics, you can customize this equation-writing software to produce equations with exactly the appearance you want, letting you work at amazing speed. Mar 93

★★★ **f(z) 6, Lascaux Graphics, 602/299-0661, $115.** The main problem this math software attacks is four-dimensional visualization. It costs slightly more than a textbook, making it a great educational bargain. Sep 93

★★★ **FAStat 2.0, SYSTAT, 708/864-5670, $495.** Statistical business-analysis software makes sense as a day-to-day statistics tool. It provides the right tests for most requirements, and its graph types provide plenty of information, although they lack glamour. Jun 93

★★★ **InStat 2.01, GraphPad Software, 619/457-3909, $95.** For scientists with limited statistics backgrounds, the chatty clarity of this lab-oriented statistics software's help screens will be invaluable, while the limited variables and minimal graphics won't be a problem. Nov 93

★★★★ **MacPhase 1.2, Otter Solutions, 315/768-3956, $159.** Low-cost, scientific-data-visualization software with a large assortment of mathematical tools is an authentic bargain. A principal strength is a well-planned color lookup table editor that's delightfully easy to use. May 93

★★★ **MathCAD 3.1, MathSoft, 617/577-1017, $495.** Numerical and symbolic computation software is easy to learn and use, and is much more powerful than earlier versions. It doesn't compete in scope with the largest math programs, but for most science and engineering tasks, it's a fast way to get problems solved. Jun 93

★★★★ **Mathematica 2.2, Wolfram Research, 217/398-0700, $595.** The one essential program in science and mathematics adds a function browser that makes the program as easy to use as it should be, as well as improvements to computational routines. Sep 93

★★★★ **MathType 3.0, Design Science, 310/433-0685, $199.** This equation-writing software makes automatic typographical decisions, which is helpful if you produce documents on a wide range of subjects. Its smooth integration with Microsoft Word is also convenient. Mar 93

★★★ **QC Tools 1.0, Abacus Concepts, 510/540-1949, $245.** Quality-control tool kit for StatView appears to introduce a slight slowdown in program response, but is generally well designed, well documented, and suitable for quality-control neophytes as well as professionals. Jan 94

★★★★ **Spyglass Dicer 2.0, Spyglass, 217/355-6000, $695.** Scientific 3-D visualization tool displays a two-dimensional slice through a three-dimensional object (which is represented in the computer by a data table). While Dicer pushes the limits of the Mac hardware, for its function this product is really the only game in town. Jul 93

★★★ **Spyglass Transform 3.0 (3.01), Spyglass, 217/355-6000, $595.** Scientific-visualization software can access data stored in every common format, offers some useful presentation-graphics features, and includes a programming language with a large range of built-in, high-level scientific functions. Sep 93

★★★★ **StatView 4.01 (4.02), Abacus Concepts, 510/540-1949, $595.** If your work uses statistics for decision support rather than abstract analysis, and you regularly have to present your results to nonstatisticians, this is the statistics package for you. Oct 93

★★★ **Sum Total 1.01, Concurrent Engineering Tools, 602/464-8208, $99.95.** Exceptional calculator utility is packed with advanced features, including a mode that lets you sample colors and use the numerical color values in calculations. The convenient palette approach causes a distinct time-lag in menu operations. Oct 93

★★★★ **Theorist 1.5, Prescience Corp., 415/543-2252, $289.95.** Symbolic-math program that you can figure out by yourself adds a useful table feature, more special functions of physics, and better graphics. It's still the only program to use real notation directly. May 93

★★★★ **Turing's World 3.0, CSLI Publications, 312/568-1550, $19.95.** Computer-science educational software lets you investigate some fundamentals in computing at an almost unbelievable bargain price. Feb 94

★★★★ **Visualization of Natural Phenomena, Telos/Springer Verlag, 408/249-9314, $59.95.** CD-ROM introduction to applying all aspects of computer graphics to scientific imaging covers all disciplines and offers definitive analysis of methods. No other source covers this much material, at this level of clarity. Jan 94

★★★★★ **Voyager II 1.0 (1.01), Carina Software, 510/352-7328, $159.95.** If a brilliantly lit, star-filled sky holds more than a moment's fascination for you, you need to know about this astronomy program. In a firmament of mostly faint and forgettable astronomy software, it's a supernova. Jul 93

ORGANIZATION/PRODUCTIVITY

★★★ **Achieving Your Career 1.02 (1.04), Up Software, 415/921-4691, $69.** HyperCard-based job-search software succeeds by compactly organizing. It provides a structure for identifying letters to write, phone calls to make, and interviews to follow up. Aug 93

★★★★ **CalendarMaker 4.0, CE Software, 515/224-1995, $59.95.** Polished, intuitive calendar-making program is straightforward, with a variety of options for customizing your calendar. Some features can be cumbersome. Oct 93

★★ **ClienTrac 1.7.1 (1.7.2), Whiskey Hill Software, 415/851-8702, $135.** Easy-to-use, HyperCard-based contact-management software performs as billed, but fails to inspire much enthusiasm. Aug 93

★★★ **Contact Ease 2.0.1 (2.0.2), WestWare, 619/274-5053, $395 to $1495.** Contact-management and sales-automation software helps salespeople keep in touch with contacts, makes it easy to generate letters, and maintains detailed records of activities. It has a few quirks but is overall a good program. Aug 93

★★★★ **DateBook and TouchBase Pro Bundle, Aldus Corp. Consumer Division, 619/558-6000, $149.95.** Calendar and contact manager offer a superior combination of integration, usefulness, and features. If you want to get organized, make sure you look at this dynamic duo. Feb 94

★★★★ **DayMaker 2.0 (2.03), Pastel Development Corp., 212/941-7500, $129.95.** If you need to organize a great deal of disparate information, follow up on meetings with many people, create an archive of completed work, and print out lists of to-do items, this free-form personal information manager is an excellent choice. May 93

★★★ **Dynodex 3.0 (3.0.1), Portfolio Software, 802/865-2700, $59.95.** The speed and printing options of this field-based address-book manager are its strengths, but this upgrade adds welcome improvements to the interface, including automatic formatting of phone numbers. Apr 93

★★★★ **In Control 2.0, Attain Corp., 617/776-1110, $89.95.** The best features of an outlining program are combined with those of a database, making it easy to sort, search, organize, and print your to-do list. Aug 93

★★★ **LapTrack For the Mac 1.0b (1.0g), Timeslips Corp., 508/768-6100, $79.95.** Time- and expense-tracking program offers the right features for the on-the-go professional, but the interface is overcomplicated and the documentation is sloppy. Still, in spite of its flaws, it does an excellent job. May 93

★★★ **Now Contact 1.0, Now Software, 503/274-2800, $99.** This contact manager has some innovative features and could easily become the top address-book program for the Mac by adding some features, such as file reconciliation. Mar 94

★★★★ **Now Up-to-Date 2.0, Now Software, 503/274-2800, $69.95 to $599.** Calendar utility combines flexibility, ease-of-use, and streamlined operations in an almost irresistible package. The Reminder control panel, although a great new feature, has had some minor conflicts. Jun 93

continues

Star Ratings

★★★ **Power Team 1.0, ProVue Development Corp., 714/892-8199, $149.95.** Personal information manager consists of seven modules: Phone Book, Calendar, Correspondence, Checkbook, Calculator, Expense Report, and Mailing List. It has some bugs, but the data entry features are excellent. Oct 93

★★ **Rae Assist 1.0.2, Rae Technology, 408/725-2850, $199.** Although this personal-information manager offers some fresh ideas, including automatic linking of company and contact information, it's too big and too slow. Jan 94

★★★★ **Spiral 1.0 (1.02), Technology Works, 512/794-8533, $129.** Designed specifically for taking and organizing notes, this product has an excellent feature set, but it's marred by some errors in the editing and import/export processes. Mar 93

★★ **TimeVision 1.0, Powercore, 815/468-3737, $99.** New scheduler with notepad and card-file functions tacked on has some worthwhile features, but in general doesn't match up to the competition. May 93

PRESENTATION TOOLS

★★★★ **Action 1.0 (1.0.2), Macromedia, 415/252-2000, $495.** Entry-level multimedia integration program offers, for its price, a rich selection of features, including a variety of transitions as well as gradient and patterned backgrounds. Feb 93

★★★★ **Adobe Premiere 3.0, Adobe Systems, 415/961-4400, $695.** Solid and dependable QuickTime video-editing software offers a structured, responsive, and flexible interface with enhancements that range from the mundane to the dramatic. It can now mix 99 tracks. Jan 94

★★★★ **Astound 1.0, Gold Disk, 408/982-0200, $399.** Presentation software lets you include sound, text, and graphics animation with no more effort than pasting in a chart in other products. It's a good value. Nov 93

★★★★ **Authorware Professional 2.0.1, Macromedia, 415/252-2000, $4995.** Multimedia-scripting and -presentation software lets you develop complex presentations with amazing speed. Although expensive, it's wonderfully done and will pay for itself in time saved. Feb 94

★★★ **Avid VideoShop 2.0, Avid Technology, 508/640-6789, $499.** QuickTime video-editing program shines in its intuitive, easy-to-use interface, although it may fall short on features for serious video professionals. Feb 94

★★ **Comet CG 1.0.3 (2.2), MSI, 317/842-5097, $995.** Program for generating antialiased text over live video is reasonably priced compared with dedicated graphics systems, but you're likely to be as astonished by its limitations as you are impressed by its capabilities. May 93

★★★★ **CoSA After Effects 1.1, CoSA, 401/831-2672, $1295.** QuickTime movie editor blurs the boundaries between animation and traditional video-editing. It produces results that simply can't be created in other packages. Oct 93

★★ **Elastic Reality 1.0, ASDG, 608/273-6585, $349.** Exciting morphing tool can create professional-caliber results—if you can figure out how to use it. The needlessly convoluted interface, poor documentation, and inadequate tech support make that a difficult task. Feb 94

★★★ **Hi Rez Audio Volume 1.0, Presto Studios, 619/689-4895, $149.95.** The enjoyable, high-quality music on this CD-ROM adds a nice touch to presentations. The software for browsing the music is quirky, and the product could use some documentation. Jul 93

★★★ **Interactive Training for Director 1.1, Media In Motion, 415/621-0707, $199.** This somewhat expensive program teaches basic Macromedia Director skills and provides a foundation for exploring Director's other features. It has a clear, often lighthearted approach, but navigating the lessons can be frustrating. Jun 93

★★★ **Macromedia Director 3.1 (3.1.3), Macromedia, 415/252-2000, $1195.** Versatile multimedia authoring tool adds 23 scripting commands, QuickTime, and a utility that compiles movies into a faster playback format—along with adding a whopping $149 to the price. Feb 93

★★★ **Media-Pedia Video Clips, Media-Pedia, 617/235-5617, $195 to $495.** Fifty-seven minutes of stock footage for use in QuickTime movies includes over 150 different segments, ranging from unremarkable to dramatic to genuinely funny. Apr 93

★★★★ **Microsoft PowerPoint 3.0 (3.0b), Microsoft, 206/882-8080, $495.** This presentation program is ahead of the pack in terms of convenience and ease of use. Although the ready-made template collection is pretty paltry, the extensive system of master layers, reliable cross-platform compatibility, and strong on-screen presentation capabilities more than compensate. Feb 93

★★ **MovieWorks 1.1, Interactive Solutions, 415/377-0136, $395.** Over 100 bugs were fixed in version 1.1 of this multimedia authoring software that takes an all-in-one approach to creating presentations, but problems remain. It's a good idea, poorly executed. Jun 93

★★★ **QuickFlix 1.0, VideoFusion, 419/891-1090, $149.** Approachable QuickTime moviemaking software lacks the high-end features of other programs but costs a whole lot less. Feb 94

★★★ **Special Delivery 1.0 (1.1), Interactive Media Corp., 415/948-0745, $399.** While this entry-level multimedia package has all the tools you need to assemble interactive screen presentations that burst with motion and sound, it has a disorienting interface and lacks the polish and power of other programs. Mar 93

★★★ **VideoFusion 1.0.1 (1.5), VideoFusion, 419/891-1090, $649.** Collection of special effects for QuickTime movies may not be for the casual user, but if you have the equipment and you can't live without spinning logos, then go ahead and indulge. Jul 93

★★★★ **Working Model 1.0, Knowledge Revolution, 415/553-8153, $995.** Animators and engineers will love this terrific motion simulator that mimics real motion by applying physical laws to objects. It's easy to learn and use, but you'll need some understanding of math and physics. Oct 93

PROGRAMMING

★★★ **CLImate 1.0, Orchard Software, 617/876-4608, $59.95.** With a little more documentation and a few more sample programs, this utility that provides a subset of Unix-like commands for the Mac environment could be an irresistable package. Oct 93

★★★ **EISToolKit 2.0 (2.11), MicroStrategy, 302/427-8800, $1995.** Reliable, field-tested developer's environment for creating executive information systems provides automatic access to information in spreadsheets and databases across a distributed system. May 93

★★★★ **FutureBASIC 1.0 (1.02), Zedcor, 602/881-8101, $299.95.** Complete, easy-to-learn, real-world programming tool has full Toolbox, System 7, and assembler support. It's a wonderful tool that's rapidly becoming a favorite among commercial developers. Jul 93

★★★ **Macintosh Common Lisp 2.0 (2.0.1), APDA, 716/871-6555, $495.** Anyone who likes programming in LISP will be pleased with the environment provided by this version of the standard dialect and its extensive debugging and interface-building facilities. Oct 93

★★★ **MetaDesign for the Macintosh 3.0, Meta Software Corp., 617/576-6920, $250.** This diagramming tool for structured systems analysis offers easy ways to group and ungroup symbols in diagrams and to show relationships between symbols. It excels at austere, classic flowcharts but could use some flashier features, such as shaded backgrounds, for presentations. Mar 93

★★★ **Object Logo Student Edition, Paradigm Software, 617/576-7675, $49.95.** This book-plus-disk package offers a wide-ranging introduction to programming concepts. It's aimed roughly at the high-school educational level and lets you see something happen for every few lines of code you type. Jul 93

★★★★ **PG:Pro 1.5 (2.1), Staz Software, 601/255-7085, $169.** For part-time or novice programmers, the combination of these BASIC programming tools and FutureBASIC is a fast path to a working program. Jul 93

★★★ **PowerPacks 2.0, NDG Phoenix, 301/718-8880, $225.** Programmers' tool kit for 4th Dimension provides 280 external procedures to improve custom applications and exploit System 7 features. Don't expect any quick fixes for 4D's less-than-blistering performance in most areas, though. Oct 93

★★★★ **Smalltalk/V for Macintosh 2.0, Digitalk, 714/513-3000, $495.** Object-oriented development system is now even more viable for commercial projects, while Digitalk's customer support and documentation set a standard other vendors should emulate. Feb 94

★★★ **SoftPolish 1.1, Language Systems Corp., 703/478-0181, $295.** Program-quality-assurance utility systematically checks the resources in a program's interface against a huge laundry list of errors. It's a programming tool for anyone who hopes to produce a commercial Mac application. Sep 93

★★★ **SourceSafe 2.1, One Tree Software, 919/821-2300, $295 to $1195.** Solid, relatively easy-to-use product handles program-development administrative tasks, including version control, for multiplatform programs being created by groups. Sep 93

★★★★ **Symantec C++ for Macintosh 6.0, Symantec Corp., 408/253-9600, $499.** If you like Think C, you'll like this software-development system, too. For the Mac, it's an excellent opportunity to catch a new wave in programming. Nov 93

UTILITIES

★★★ **7th Heaven 2.5 (2.5.1), Logical Solutions, 612/659-2495, $99.95.** Our reviewer found the seven enhancements to System 7 fun and elegantly done, but not all of them were useful. Jul 93

★★★ **Alki Seek 2.1, Alki Software Corp., 206/286-2600, $39.95.** Competent file-finding utility scans by file name or content and lets you combine multiple search criteria. It cannot search in the background or find text in compressed files. Jul 93

★★★★ **At Ease 1.0 (1.1), Apple Computer, 408/996-1010, $59.** Sweet, simple, secure substitute for the Finder displays a clean, attractive page full of oversize icons where a single click launches a program or document. To delete, rename, or move files, you have to return to the Finder. Mar 93

★★★ **Billy Steinberg's PBTools 1.0.1, Inline Software, 203/435-4995, $99.55.** If you want basic PowerBook management without added frills or complex

menu bar displays, this collection of four utilities may be just your cup of tea. Jul 93

★★★ **Chameleon 2.0.3 (2.1), Logical Solutions, 612/659-2495, $59.95.** Sleek desktop-pattern editor comes with an ample supply of rich, textured color images and a set of limited but functional editing tools. Sep 93

★★★★ **ClickChange 2.0, Dubl-Click Software, 818/888-2068, $89.95.** Interface-customizing package has nothing you need but is filled with everything you want, including tools that let you alter major elements of the Mac's look and feel. Aug 93

★★★ **Connectix Desktop Utilities 1.0 (1.0.1), Connectix Corp., 415/571-5100, $99.** Although some of the 16 utilities offered in this package are more at home on a PowerBook, this collection offers one-stop shopping at a low price. It's worth it for the file-synchronization, Keyboard Power, and Hot Keys features alone. Nov 93

★★★★ **CopyDoubler 2.0 (2.0.1), Symantec/Fifth Generation Systems, 504/291-7221, $59.** This utility speeds up copying, lets you queue jobs for background copying, and offers a variety of other useful, copying-oriented features—all at a very reasonable price. Nov 93

★★★ **Copyright Pro 1.0.3, CSG Technologies, 412/471-7170, $79.** Utility takes over the Finder's copying function, copies in the background, and allows you to regularly schedule copying. It doesn't speed up copying, however. Nov 93

★★★★ **CPU 2.0 (2.0.1), Connectix Corp., 415/571-5100, $99.** Reasonably priced collection of utilities for the PowerBook adds new features, including file synchronization, that easily justify the upgrade price. Sep 93

★★★ **CryptoMactic 1.0.1, Kent Marsh, 713/522-5625, $99.** Security software offers fast Finder-level encryption and decryption with effective file removal. Although its simplest encryption algorithm isn't quite hacker-proof, it's worth considering. Feb 94

★★★ **DiskFit Direct 1.0, Dantz Development Corp., 510/849-0293, $49.95.** Basic but efficient backup system is simple and painless enough to foster better backup habits in anyone who uses it. It doesn't back up to hard drives or tape drives. May 93

★★★★ **DiskLock PB 1.0, Symantec/Fifth Generation Systems, 504/291-7221, $59.** PowerBook security software balances robust security with simplicity and ease of use. It's much harder to crack than most PowerBook utility collections' security features, and will keep out all but the most determined. Jan 94

★★★ **The Disney Collection Screen Saver, Berkeley Systems, 510/540-5535, $49.95.** Mickey, Goofy, Peter Pan, Ariel, and other Disney favorites cavort around your screen with this screen saver that includes 16 different modules. Mar 94

★★★ **DriveShare 1.03, Casa Blanca Works, 415/461-2227, $129.95.** This utility allows users to share a removable drive over a network. It's most useful if your network consists of both System 6 and System 7 users, as its advantages over System 7 file sharing are slight. Nov 93

★ **DriveTech 1.0, MicroMat Computer Systems, 415/898-6227, $59.95.** Without decent documentation or clearer error messages, this floppy-drive cleaning and diagnostic program is essentially a $60 floppy-drive cleaning kit. Since you can buy a cleaning kit without software for $10, that makes it a bad deal. Jan 94

★★★ **DupLocator 1.03, Midnight Software, 303/933-1013, $99.** For new Macintosh users who don't have a general file utility, this software that locates duplicate files, as well as performs basic file commands such as moving and renaming files, may be useful. Jan 94

★★ **DynoPage 2.0, Portfolio Software, 802/865-2700, $59.95.** While this utility simplifies the printing of booklets and double-sided pages, it doesn't support PostScript graphics, is incompatible with some popular applications, and has a buggy drag-and-drop feature. Jul 93

★ **eDisk 1.0 (1.2), Alysis Software Corp., 415/566-2263, $149.95.** Driver-level compression software has little to recommend it over file-level, idle-time compression programs. The biggest drawback is the strong potential for disk or file corruption. Oct 93

★★★ **Freedom of Press Classic, ColorAge, 508/667-8585, $149.** Utility allows you to print PostScript graphics on almost any non-PostScript printer—easily and with impressive results. Mar 94

★★★ **Icon 7, Inline Software, 203/435-4995, $79.95.** Simple, straightforward utility has a streamlined and intuitive library feature for storing and retrieving icons, plus tools for icon editing. Its icon collection, however, is pretty paltry. Sep 93

★★★ **Icon-It Pro 3.0.6, Olduvai Corp., 305/670-1112, $129.** Utility allows you to attach custom tool bars to almost any application, including the Finder. The interface is quirky, but you get used to it. Dec 93

★★★ **I Like Icon 1.0, Baseline Publishing, 901/682-9676, $59.95.** Glitzy utility has tools for icon editing, has a nice library of icons, and can create animated icons. Some basic features, such as a text tool, are missing, and the animated icons are fun but impractical. Sep 93

★★★ **INITPicker 3.0 (3.02), Inline Software, 203/435-4995, $79.95.** This INIT manager's ability to load aliased INITs over a network will interest network managers. While it disables problem INITs at start-up, it doesn't help you identify the cause of INIT conflicts that don't cause the Mac to crash at start-up. Mar 93

★★★★ **Inline Sync 1.0 (1.01), Inline Software, 203/435-4995, $129.95.** Keep the latest version of your work on your portable machine and your desktop Mac with this file-sync software. It's easy to install, easy to use, easy on the wallet, and does the job well. Mar 93

★★★★ **KidDesk 1.0 (1.1), Edmark Corp., 206/556-8484, $39.95.** If you have young children who love to experiment with your Mac, this desktop environment provides easily navigable play while protecting your files from the havoc that little fingers can wreak. Jun 93

★★★ **MacPak 1.0, Symantec/Fifth Generation Systems, 504/291-7221, $149.** The quality of this utility collection is uneven—some modules are unpolished—but if you don't already own AutoDoubler, CopyDoubler, and a good file-management program, it's worth the price. Jan 94

★★★★ **MacTools 3.0, Central Point Software, 503/690-8090, $149.** Recovering trashed files is a snap with this utility package that fixes more disk problems than its competition. It includes disk-and-file maintenance, disk repair, virus protection, and backup. Mar 94

★★ **Magic Typist 2.0, Olduvai Corp., 305/670-1112, $129.** If you want to speed up typing of repetitive phrases or if you don't have full use of your hands, this utility, which automates typing of repetitive phrases, may be useful, but some functions work erratically or not at all in Microsoft Word. Sep 93

★★★★ **Mr. File 2.0, Softways, 408/978-9167, $99.** The well-designed background capabilities of this Finder utility make it a handy tool for copying, finding, moving, launching, and renaming files, although it has a few interface quirks. Dec 93

★★★ **Norton Essentials for PowerBook 1.0, Symantec Corp., 310/453-4600, $129.** Uneven collection of PowerBook utilities ranges from the useful Instant Access module, which automatically turns AppleTalk on and off, to the relatively inaccurate Battery Gauge feature, which tries to tell you your battery's status. Apr 93

★★★ **Now Compress 1.0 (1.0.1), Now Software, 503/274-2800, $99.** Compression utility holds its own in a crowded market, it's easy to use, it's complete and it compresses as well as or better than other options. Dec 93

★★★ **Now Fun, Now Software, 503/274-2800, $69.** Five control panels let you liven up your Mac by customizing everything from menu colors to system sounds. The included screen-saver modules and desktop patterns and pictures are fairly limited, though. Dec 93

★★★★ **Now Utilities 4.0.1 (4.0.1p), Now Software, 503/274-2800, $129.** Many thoughtful improvements have been added to this collection of utilities, which is now better integrated, more logically designed, and still an excellent deal for your dollar. The new scrapbook feature, however, is awkward and inconvenient. Aug 93

★★★ **OptiMem 1.4.1, Jump Development Group, 412/681-2692, $129.** Systemwide memory manager monitors RAM use and allocates RAM where it's needed. Works best with software that handles minimum-memory situations effectively. Mar 94

★★★ **Peace of Mind 1.2.2, Polybus Systems Corp., 716/871-6533, $149.** Hardware diagnostic tool performs exhaustive tests on major Mac hardware components; does an excellent job of diagnosing simple simulated hardware errors. The program has minor bugs and lacks a comparative test-history feature. Jun 93

★★★★ **PicturePress 2.5, Storm Technology, 415/691-6600, $199.** This image-compression software supports every useful storage mode, has new calculation features for improved image fidelity, and is twice as fast as version 2.0. Mar 93

★★★ **PowerMerge 1.0.2 (1.0.3), Leader Technologies, 714/757-1787, $129.** File-synchronization utility has a potentially confusing interface, but is a handy means of updating selected files so that different Macs end up with identical versions of the selected documents. Apr 93

★★★ **Power To Go 2.0, Claris Corp., 408/727-8227, $99.** PowerBook utility collection has a few unique slants—including a floating palette that can display battery-life estimates—that keep it above the also-rans. It does lack features of similar products. Dec 93

★★★ **Public Utilities for the Macintosh 1.0, Symantec/Fifth Generation Systems, 504/291-7221, $149.** Utility program sticks to the basics of disk diagnosis, disk repair, and file optimization. It does a good, and in some cases unique, job, although disk optimization is slow. Jun 93

★★★★ **QuicKeys 3.0, CE Software, 515/221-1801, $169.** The simple, unintimidating interface of this macro-building utility allows you to build a set of useful shortcuts quickly. Mar 94

★★★ **RapidTrak 1.0.1 (2.0), Insignia Solutions, 415/694-7600, $99.95.** If you've got RAM to spare, this hard drive formatter offers driver-level RAM caching to store frequently used data and improve performance, especially on slower-speed drives. May 93

★★★ **Redux Deluxe 2.0.2, Inline Software, 203/435-4995, $79.95.** Easy to learn and relatively simple to use, this backup program has some powerful features, such as scripting, but it doesn't have a compression option. Jan 94

★★★★ **Retrospect 2.0, Dantz Development Corp., 510/849-0293, $249.** Powerful backup and archiving software has an improved interface and scripting

continues

Star Ratings

capabilities, and works well for all levels of users. Sep 93

★★★★ **Retrospect Remote 2.0, Dantz Development Corp., 510/849-0293, $449.** Utility allows fast, automatic backup of networked Macs to a central Mac with a backup device. It worked flawlessly in our reviewer's tests. Sep 93

★★★ **5afe and 5ound, Central Point 5oftware, 503/690-8090, $49.95.** Limited but useful disk-protection and -salvage utility has a clean, simple interface and is an efficient emergency recovery tool. Jun 93

★★ **5afe or 5orry 1.0, Olduvai Corp., 305/670-1112, $59.** Unobtrusive control panel periodically saves all of your keystrokes, but requires System 7.1 and offers no clear-cut advantages when compared with other text-recovery programs. Oct 93

★★ **5afeDeposit 1.2, Dayna Communications, 801/269-7200, $189.** Automated backup program is easy to set up but slow. Also, unattended backups must be restarted from scratch if disk space runs short and a new disk isn't inserted. Sep 93

★★★★ **5AM 3.5.8, 5ymantec Corp., 408/253-9600, $99.** Efficient, thorough virus-protection software slows down system start-up and application launching, but this program is a worthwhile investment for anyone who exchanges or downloads files. Mar 94

★★★★ **5creenscapes 1.0.1, Kiwi 5oftware, 805/685-4031, $44.95.** With more than 600 desktop patterns—and a suite of well-designed modules to transform those patterns—this fun and frivolous utility lifts desktop-pattern design to new heights of elegance. Nov 93

★★★ **5quare One 1.5.2, Binary 5oftware, 310/582-8293, $74.** Flexible, attractive icon-based file launcher provides infinitely customizable palettes, including one that displays active applications. The application will consume 400K of your system memory. Aug 93

★★ **5tacker for the Macintosh 1.0.1, 5tac, the Data Compression Company, 619/431-7474, $149.** As long as you pay attention to the capacity of your hard drive, this driver-level compression product performs reasonably well, except for its slow hard drive read quotient. Oct 93

★★★★ **5tar Trek: The 5creen 5aver, Berkeley 5ystems, 510/540-5535, $49.95.** Go where no Mac has gone before with this screen saver based on the original "Star Trek." May 93

★★★★ **5tar Wars Visual Clips, 5ound 5ource Unlimited, 805/494-9996, $89.95.** This control panel lets you play QuickTime movie clips from *Star Wars* at system events. If you have the money, the hard drive space, and the RAM, this is the kind of totally cool toy that will make you remember why you love your Macintosh. Sep 93

★★★ **5uper 7 Utilities, Atticus 5oftware, 203/324-1142, $99.95.** Collection of seven control panels/extensions adds some ease of use to System 7, although none of its functions are essential. Modules perform tricks such as turning any menu into a tear-off palette, and randomizing the sounds that play in response to errors. Apr 93

★★★ **Tempo II Plus 3.0.9, Affinity Microsystems, 303/442-4840, $179.95.** Very capable macro-creating utility may be daunting for novices but offers plenty of power for advanced users. Mar 94

★★★★ **TimesTwo 2.0, Golden Triangle Computers, 619/587-0110, $149.** This driver-level compression utility is transparent and robust. It caused no problems through a two-month course of testing, on a system with myriad utilities and system software tools. Mar 94

★★★★ **Toner Tuner 1.0.3, Working 5oftware, 408/423-5696, $24.95.** This inexpensive, incredibly useful extension adds a sliding bar to print dialog boxes allowing you to adjust the amount of toner applied to each print job. If you can't save trees, you can at least save toner. Dec 93

★★★★ **ultra5hield 1.252 (1.3), usrEZ 5oftware, 714/756-5140, $149.** Sophisticated security product combines practically every feature you might need into an integrated package, including a lightning-fast version of the U.S. government data-encryption standard. Dec 93

★★★ **Virtual 3.0.1, Connectix Corp., 415/571-5100, $99.** If you need to eke out as much virtual memory speed as possible, this utility may be a useful tool. For System 6 users who want virtual memory, it's the only game in town. Sep 93

★★★ **Working Watermarker 1.02, Working 5oftware, 408/423-5696, $49.95.** Simple, useful system extension allows you to print or fax text and/or graphics "watermarks" in the background of virtually any document. Although it has imperfections, it's earned a permanent spot in our reviewer's System Folder. Jan 94

VERTICAL MARKETS

★★★ **Compare-A-Loan 4.0.2 (4.1), 5oftflair, 612/894-3357, $79.95.** Although geared to professionals, this product for home-loan evaluation provides thorough documentation and is structured so that anyone can use it. Apr 93

★★★ **Expert Home Design 1.0 (1.0.3), Expert 5oftware, 305/567-9990, $49.95.** Quickly and easily create home- or office-interior layouts that are precise, but not as detailed as blueprints, with this interior design software. May 93

★★★★ **Finale 3.0.1, Coda Music Technology, 800/843-2066, $749.** Upgraded music-notation software is now infinitely more pleasant to use. Its comprehensive feature set makes it the standard against which all other music-notation products must be judged. Dec 93

★★★ **LoanLease Library 3.0.3 (3.05), 5oftflair, 612/894-3357, $99.95.** If you are generating a loan or a lease and need to keep track of payments, this well-documented program for loan evaluation is a worthwhile investment, despite its minor eccentricities. Apr 93

★★★ **MacGrade 1.5.5, CalEd Software, 408/625-6667, $85 to $245.** Grade-book program has a straightforward, simple interface and clear documentation. Although there's room for improvement, it's easy to use and flexible. Feb 94

★★ **MacInteriors, Microspot, 408/253-2000, $129.** Correctly placing objects is unduly cumbersome in this interior-design software, but once you catch on to the program's quirks, it's useful. Feb 94

★★★★ **Musicshop 1.0, Opcode 5ystems, 415/856-3333, $149.95.** MIDI sequencer is an excellent choice as a first sequencer. It's powerful enough to satisfy the needs of most MIDI users. Oct 93

★★★ **Roll Call 2.0 (2.5.6 or 3.0), By the Numbers, 603/927-4508, $495 to $595.** 4th Dimension database application for church management helps track donations, attendance, church-group membership, and visitation. While not a complete church-management system, it's an acceptable complement to a general accounting program. Aug 93

★★★ **5ailing Master 1.1, 5tarboard 5oftware, 313/662-4393, $64.99.** Though the slow speed and jerky motion point to less-than-polished programming, this sailboat-racing simulation offers good tactical play and is fun—well worth the price for sailing competitors. Nov 93

WRITING TOOLS

★★★★ **Final Draft 2.0.3 (2.0.4), MacToolkit, 310/395-4242, $349.** Script writing gets simpler with this well-conceived software that automates formatting of different elements in a script. Customization is easy, and macros automate typing of common phrases. Apr 93

★★★ **Just Joking 1.0, Word5tar International, 415/382-8000, $49.** HyperCard stack of around 2800 humorous quotations offers a serviceable selection of sayings from a diverse group of humorists, comedians, philosophers, and writers, among others. Apr 93

★★★★ **MacWrite Pro, Claris Corp., 408/987-7000, $249.** Many of the new features of this upgrade are very well executed, including the easy-to-use table feature, simple but elegant palettes, and an almost pain-free mail merge feature. Jul 93

★★ **MasterWord 5.1, Alki 5oftware Corp., 206/286-2600, $99.95.** The centerpiece of this package of add-on Microsoft Word commands is a set of customizable tool bars. Unfortunately, rough edges remain, including inaccuracies in the documentation and some features that don't work as advertised. Aug 93

★★★★ **Microsoft Word 5.1 (5.1a), Microsoft, 206/882-8080, $495.** This small, solid upgrade fine-tunes some plug-in modules and adds new modules including an icon tool bar and text annotation. While it's worth the upgrade price, it won't give Word 5.0 users goosebumps. Mar 93

★★★ **RightWriter for the Mac 5.0, Que Software, 317/573-2500, $99.95.** Grammar checker looks at writing style, word usage, punctuation, and capitalization, as well as grammar. Customizable filters and multiple approaches to analysis are nice, but—as with all grammar checkers—not all the advice is great. May 93

★★★ **5how5cape 4.1, Lake Compuframes, 914/941-1998, $429 to $679.** This script-writing software formats scripts in either screenplay format or dual-column format (for audio and video) and allows you to choose the number of shots displayed per page, but it requires you to own and work in WordPerfect. Apr 93

★★★ **5pelling Coach Professional 4.0.1, Deneba 5oftware, 305/596-5644, $195.** If you're considering investing in reference software, this spelling checker, dictionary, and thesaurus is a relatively capable, if expensive, alternative. Oct 93

★★★★ **Thunder 7 1.5.3, Baseline Publishing, 901/682-9676, $99.95.** Stand-alone spelling checker and thesaurus interactively monitors your keystrokes and alerts you to potential errors as they are entered. It quickly and transparently prevents you from making embarrassing typos. Nov 93

★★★ **VersionMaster 1.5, A5tar Technologies, 508/486-8532, $199.95 to $1199.95.** Document-management utility helps you archive and track versions of a file by maintaining a database of altered documents. It's recommended only for workgroups that routinely follow check-out procedures. Apr 93

★★★★ **WordPerfect for Macintosh 3.0, WordPerfect Corp., 801/225-5000, $495.** The innovative interface of this word processor uses context-sensitive button bars and expandable rulers to make innumerable features accessible with a click of the mouse. It's an accomplishment in ease of use. Mar 94

★★★ **A Zillion Kajillion Rhymes 1.0, Eccentric 5oftware, 206/628-2687, $49.95.** Rhyming dictionary is quick, small, simple, and self-contained; but it only rhymes with the roots of search words (and ignores *-ed*, *-s*, and *-ing* endings). Nov 93

Hardware

MISCELLANEOUS HARDWARE

★★ **ACS100, Altec Lansing Consumer Products, 717/296-2818, $180.** Lightweight powered speakers don't sound as good as they should. There's too much emphasis on the high end at the expense of the midrange, and they hiss noticeably. Dec 93

★★ **ACS150, Altec Lansing Consumer Products, 717/296-2818, $150.** Subwoofer rounds out the sharp tones of the ACS100, but the bass response is neither punchy enough nor loud enough, and the unit is about the size and weight of a concrete block. Dec 93

★★ **Address Express, CoStar Corp., 203/661-9700, $499.** Flaky performance and system crashes plagued this envelope-and-label printer in our tests, but the print quality was good. Oct 93

★★ **Apple Adjustable Keyboard, Apple Computer, 408/996-1010, $219.** This keyboard is only a slight improvement on the flat slab keyboard. Theoretically, it corrects ulnar deviation, but many sufferers of repetitive stress injuries want a keyboard that adjusts vertically. Jul 93

★★★★ **AppleCD 300, Apple Computer, 408/996-1010, $599.** Double-speed CD-ROM drive spins its discs at twice the speed of earlier drives, providing faster access to large files. Jun 93

★★★★ **Apple Color OneScanner, Apple Computer, 408/996-1010, $1349.** Tests of this color scanner demonstrate unpolluted colors and sharp image details, perhaps due to color filters and lenses that Apple claims were designed and tuned for the scanner. Jul 93

★★★ **AppleDesign Powered Speakers, Apple Computer, 408/996-1010, $179.** Tall and curvy powered speaker set looks and sounds good and can produce uncomfortably high volumes without noticeable distortion, but the bare-wire-and-terminal connections aren't user-friendly. Dec 93

★★★ **Apple Newton MessagePad, Apple Computer, 408/996-1010, $699.** Although Apple released this personal digital assistant too early and marketing hype led to mistaken expectations, this is a very intelligent piece of work with an impressive variety of serious business uses. Dec 93

★★★ **Apple PowerCD, Apple Computer, 408/996-1010, $400.** This extremely versatile and beautifully designed portable CD-ROM drive offers impressive audio and Photo CD features, but if you're a serious CD-ROM user, it's too slow to satisfy. Jan 94

★★★★ **ArtZ ADB Tablet, Wacom Technology Corp., 206/750-8882, $449.** Combining pressure-sensitive operation, manageable size, and a new pencil-thin stylus, this affordable digitizing tablet is perfect for artists looking for traditional-style control of their graphics programs. Aug 93

★★★ **Computer Crayon, Appoint, 510/463-3003, $49.** The kid contingent's verdict was a definite thumbs-up on this brightly colored input device that's shaped like a thick pencil. The buttons can be hard for smaller children to press, and serious computer artists should still opt for a drawing tablet. Oct 93

★★★★ **Coolscan LS-10e, Nikon Electronic Imaging, 516/547-4200, $2600.** Compact desktop scanner for digitizing images from 35mm transparencies is slow, but delivers images good enough for newsprint publications and some catalogs. Dec 93

continues

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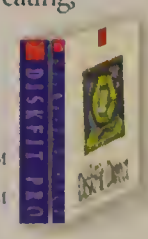

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Star Ratings

★★★ **EMBARC, Embarc Communications Services, 407/364-2000, $395 plus fees.** If you're a PowerBook user who is frequently in places with no telephone and you need timely delivery of electronic news and E-mail, this portable wireless message service may prove useful, but the cost may be prohibitive to others. Sep 93

★★★★ **Epson ES-800C, Epson America, 310/782-0770, $1499; Macintosh interface kit $399.** Flexible 400-dpi scanner offers a range of options, including one- or three-pass scanning, plus a full-featured, easy-to-use software package. Aug 93

★★ **Gulliver, Appoint, 510/463-3003, $119.** This diminutive mouse is hard to hold comfortably for an extended period, but it works well on almost any surface and is an acceptable option for PowerBook users. Oct 93

★★★ **Hello Music, Yamaha Corp. of America, 714/522-9240, $449.** MIDI starter kit includes an impressive tone generator that's compatible with General MIDI Level 1 and Roland MT-32, but the included software is functional at best. Dec 93

★★★ **LightningScan Portable, Thunderware, 510/254-6581, $459.** PowerBook owners will find this hand scanner's modem- or serial-port connection, lightweight interface, and total portability well worth the cost, although the scanner is incompatible with some desktop Macs. Dec 93

★★★★ **Mirror 800 Plus Color Scanner, Mirror Technologies, 612/633-4450, $1299.** Add the optional NuBus JPEG board ($300) and the easy-to-use 35mm transparency scanning module ($599) and this is a nifty—if slow—desktop scanning package for a reasonable price. Jan 94

★★★ **PenDirect ADB, FTG Data Systems, 714/995-3900, $498.** Input device lets you manipulate items on the Macintosh screen using a special stylus called a light pen. It works well, although it seems ergonomically inferior to a mouse for routine tasks. Mar 94

★★★ **PowerLink Presentor, E-Machines, 503/646-6699, $499.** Simple, compact Duo dock wobbles a bit when plugged in but provides fine support for a variety of displays, plus ports for ADB, floppy drive, and sound output. Nov 93

★★★ **PowerPlate, Technöggin, 513/321-1777, $169.95 to $299.95.** Line of long-lived, external PowerBook battery packs, each of which lets you work for three to five times as long as the usual PowerBook battery. Unfortunately, the System 7 power manager periodically alerts you that your battery is not charging and dims the screen though the battery pack has hours of time left. Mar 94

★★★ **RCD-202, Pinnacle Micro, 714/727-3300, $3995.** Writable CD-ROM drive is good for archiving data simply and inexpensively, but it's incompatible with many hard drives. Mar 94

★★★ **ScanMaker 35t, Microtek, 213/321-2121, $1999.** Speedy 35mm film scanner accommodates loose film and delivers a good image, but the included software is weak. Dec 93

★★★ **ScanPlus Color 6000 for Mac, PlusTek USA, 408/980-1234, $749.** Small sheetfed color scanner is not appropriate if exact color matching is critical, but it is otherwise a good, inexpensive option. Sep 93

★★★★ **ThinPack, VST Power Systems, 508/287-4600, $199.95.** External battery pack for PowerBooks is compact, with a lightweight design. It comes with handy power-management utilities. Mar 94

★★★ **TrakMate, Key Tronic Corp., 509/928-8000, $149.** Input device integrates a trackball into a wrist pad. While the design is interesting, it's not for everyone. Feb 94

★★★ **The UnMouse, MicroTouch Systems, 508/659-9000, $199.** Input device is a cursor-control device, programmable keypad, and small graphics tablet in one, and can be programmed with 60 macros (although only 16 can be selected by sight). It's ergonomically better than a mouse, but not as good as a trackball. May 93

★★★ **Yamaha TG100, Yamaha Corp. of America, 714/522-9011, $449.** Compact, keyboardless, multitimbral MIDI synthesizer adheres to the General MIDI standard patch arrangement. Although it won't convince you that you're hearing a live orchestra, the sound is about as realistic as low-cost MIDI gets. Apr 93

MODEMS/NETWORK HARDWARE

★★★★ **AsantéHub 1012, Asanté Technologies, 408/435-8388, $1299.** This 12-port, 10BaseT Ethernet hub works right out of the box and is a premium device at a bargain price. Dec 93

★★★ **DataLink PB; Axcell Cellular Interface, Applied Engineering, 214/241-6060, $824.** If you need a full-blown office on the beach, this PowerBook cellular-modem package with automatic answering machine is a well-executed solution. Each recorded second requires 25K of disk space. Nov 93

★★★ **PerFit Port-A-Com, PerFit, 303/530-7333, $349.** Compact, ADB-powered, high-speed fax/data modem is difficult to configure, due to its Spartan and poorly organized documentation, but is still a solid product at a reasonable price. Nov 93

★★★ **SupraFaxModem 144PB, Supra Corp., 503/967-2400, $349.95.** If you're looking for a high-speed internal modem for your PowerBook, and want to save a few bucks, this one's worth considering. Disabling its fax software solved occasional transfer problems. Nov 93

PRINTERS

★★★ **Apple Color Printer, Apple Computer, 408/996-1010, $2349.** If you need large-format color output, but not precision color-matching, this well-built printer is a reasonable choice, although it doesn't support PostScript. Aug 93

★★★★ **Apple Portable StyleWriter, Apple Computer, 408/996-1010, $439.** Sleek, portable ink-jet printer weighs 4½ pounds and is a pleasure to use. It uses standard StyleWriter cartridges. Jan 94

★★★★ **DEClaser 1152, Digital Equipment Corp., 508/493-5111, $999.** Four-pages-per-minute, 300-dpi, PostScript Level 2 printer offers simultaneous support for Macs and PCs, plus excellent image quality, for a ground-breaking price. May 93

★★★★ **DeskWriter 310, Hewlett-Packard, 800/752-0900, $379 to $455.** Versatile, low-cost ink-jet printer is a 4.3-pound, battery-powered portable. With its 60-page sheet feeder, it's also a great desktop printer; and with a $49 color print cartridge, it offers inexpensive three-color printing. Mar 94

★★★ **LaserWriter Pro 600 and 630, Apple Computer, 408/996-1010, $2099 to $2529.** From their paper handling to their print quality, these laser printers are Apple's best. Unfortunately, they don't support emulation-sensing, and thus may be less desirable for mixed-platform offices than other possibilities. Jun 93

★★★★ **LaserWriter Select 300, Apple Computer, 408/996-1010, $839.** Inexpensive, low-capacity printer is networkable, and an excellent buy, despite a few weaknesses. Add a 4MB SIMM to take advantage of the amazing PhotoGrade capabilities, which allow the printer to generate 91 shades of gray. Aug 93

★★ **LaserWriter Select 310, Apple Computer, 408/996-1010, $1099.** This big, slow printer is a true Adobe PostScript printer with both Mac and DOS ports, but it's not networkable or compatible with the Communications Toolbox, it can't automatically switch ports, and it doesn't have adjustable paper guides. Aug 93

★★★ **MobileWriterPS, Mannesmann Tally Corp., 206/251-5524, $999.** Fast, portable printer is currently the only PostScript portable available. While the print quality is quite good on glossy laser paper, it's mediocre on inexpensive bond. Dec 93

★★★ **Phaser 200i Color Printer, Tektronix, 503/682-7377, $5995.** This thermal-wax color printer is fast and compact, with versatile paper-handling features. TekColor image-enhancement technologies provide excellent output quality that is, however, poor on letterhead and inexpensive photocopier bond. Aug 93

★★ **PrintPartner 10W, Fujitsu Computer Products, 408/432-6333, $2450.** While this multiplatform printer is fast and prints clearly, many Mac users will find it frustrating as it can't print some TrueType fonts. Jul 93

★★★★ **StyleWriter II, Apple Computer, 408/996-1010, $359.** Apple's ink-jet printer retains the best features of its predecessor, but costs less. New features, such as gray-scale printing and the ability to share the printer over a network, make it even more versatile. Jun 93

★★★ **WriteMove II, GCC Technologies, 617/275-5800, $599.** Portable printer for the PowerBook measures 11½ by 2 by 3½ inches and weighs 2½ pounds. It's no speed demon, but it's fine for short jobs. May 93

SYSTEMS/STORAGE

★★★ **Centris 610, Apple Computer, 408/996-1010, 4/80 $1859.** Slim-design Mac uses a 20MHz 68LC040 processor at a price-to-performance ratio that comes close to competing with Windows PCs; however, its expandability is severely limited. Jun 93

★★★★ **Centris 650, Apple Computer, 408/996-1010, 4/80 68LC040 $2699.** Moderately priced but fast 040 system offers three expansion slots and one drive bay, and (except for the base model) has built-in Ethernet, video circuitry, and a math coprocessor. Jun 93

★★★★ **DataPak 105, Mass Microsystems, 408/522-1200, $949 to $1049.** Well-built 105MB SyQuest drive comes with a decent, no-frills cartridge-formatting package and a copy of 7th Heaven. The preformatted cartridges have a lifetime warranty. Sep 93

★★★ **Duo Dock, Apple Computer, 408/996-1010, $1079.** Clever housing for Duos provides back-panel connectors, a SuperDrive, support for external monitors, and two expansion slots. Some details, such as the difficulty of installing NuBus boards, belie Apple's usual attention to detail. Mar 93

★★★ **Expert Pad PI-7000, Sharp Electronics Corp., 800/993-9737, $899.** Personal digital assistant features the advantages of the Newton, in a better industrial design and at a comparative price. If the battery lasted longer and the message network were implemented, the PDA revolution could begin. Feb 94

★★★★ **FastCache Quadra, Daystar Digital, 404/967-2077, $279 to $399.** PDS board provides 128K of secondary cache for a Quadra. The average real-world speed improvement is 15 percent, but some operations benefit more from the cache card than others. May 93

★★ **HP Optical Disk Library 10LC, Hewlett-Packard, 800/752-0900, $9495.** Optical jukebox may fill the need for 10 gigabytes of on-line storage, but its

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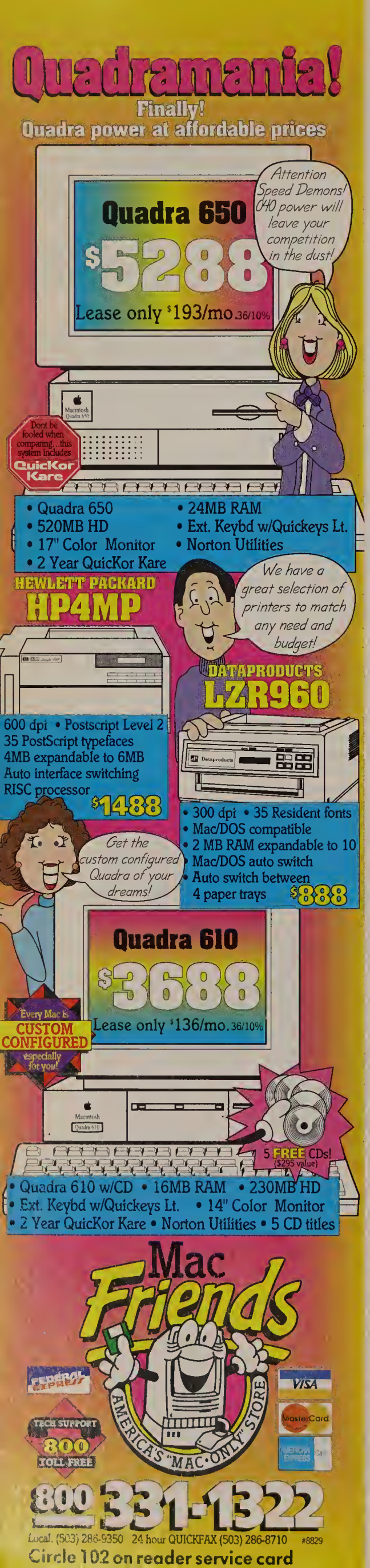

Star Ratings

performance is poor, and the software lacks the features needed for adequate management. Jan 94

★★★★ **Infinity 105 Turbo, Peripheral Land, 510/657-2211, $795 to $894.** Small, light, quiet, inexpensive 105MB SyQuest drive is ingeniously packaged and ideal for both desktop and PowerBook use. Sep 93

★★★ **Infinity Optical 3.5, Peripheral Land, 510/657-2211, $1999.** If you need the extra measure of permanence that magneto-optical storage provides—or a compact alternative to bulky cartridges—this drive, based on a Sony mechanism and using 3½-inch disks that store 120MB of data, deserves a look. Jun 93

★★★★ **LC III, Apple Computer, 408/996-1010, 4/80 $1349.** Base system comes equipped with a 25MHz 68030 processor and 512K of VRAM. This is a machine that fits the bill and the pocketbook of most home users and small-business owners. Jul 93

★★★ **MicroMac Plus Upgrade System, MicroMac, 714/362-1000, $499.** This 68030 accelerator for the Mac Plus requires disassembling a Plus and using the Plus system board to assemble the MicroMac system. It speeds up the Plus dramatically, and supports an included external full-page monochrome monitor. Jun 93

★★★★ **MultiDisk 150, Iomega, 801/778-1000, $699.** Durable cartridges are one of the strongest reasons to choose this Bernoulli removable drive. Although slightly more expensive than a SyQuest drive, it's fast and reliable, and the disks are competitively priced. Jun 93

★ **NuTek Duet, NuTek USA Corp., 408/973-8799, $2996.** Mac workalike is both a PC and a Mac in a single box, but because of many incompatibilities and problems, the Duet is not a computer anyone should consider using for serious work. Feb 94

★★★ **OrangePC, Orange Micro, 714/779-2772, $1799.** NuBus board has a DOS processor, letting you have your Mac and a PC, too. It's fairly well executed, though there are some minor problems. Oct 93

★★★★ **PowerBook 140 F/25 Upgrade, Digital Eclipse Software, 510/547-6101, $399.** By changing the oscillators and adding an FPU, Digital Eclipse changes PowerBook 140s into 170s, minus the active matrix screen. While the upgrade seems expensive, it's the only way to extend the viability of a 140. Dec 93

★★ **PowerBook 165c, Apple Computer, 408/996-1010, 4/80 $3399.** The passive matrix screen of this color notebook computer is dull and has noticeable afterimages, but if your expectations are reasonable, the speedy processor provides a pleasant work environment. Jul 93

★★ **PowerBook 180c, Apple Computer, 408/996-1010, 4/80 $4169.** The active matrix screen of this color notebook computer is beautiful but so small that its usefulness is very limited. Sep 93

★★★★ **PowerBook Duo 210 and 230, Apple Computer, 408/996-1010, 210 (4/80) $1839, 230 (4/80) $2299.** Apple's smallest computers have the pleasing heft of hardbound books but pack the horsepower of 030 chips. Although the screen, keyboard, and trackball feel small, these computers virtually cry out to be picked up and used. Mar 93

★★★★ **PowerBook Duo 270c, Apple Computer, 408/996-1010, 4/240 $3099.** Notebook computer meets all the demands of power users; it weighs less than five pounds, features a color active matrix display, and offers longer battery life. The lack of a floppy drive can be inconvenient, though. Feb 94

★★★★ **Quadra 605, Apple Computer, 408/996-1010, 4/80 $979.** Never before has Apple offered so much performance for so little money. The performance and price of this 040-based machine match those of a standard entry-level 486SX-based Windows PC. Mar 94

★★★★ **Quadra 800, Apple Computer, 408/996-1010, 8/230 $4679.** Squat, yet curvy and attractive, this minitower system has fewer expansion opportunities than the Quadra 950, but just as much power. It's fast, slick, and moderately priced. Aug 93

★★★★ **Quadra 840AV, Apple Computer, 408/996-1010, 8/230 $4069.** Technological tour de force uses a 40MHz 68040 and an AT&T 3210 digital signal processor, and is brimming with sophisticated speech-recognition and audiovisual technology. Beware of some hardware and software incompatibilities. Dec 93

★★★ **SmartStack, Envisio, 612/628-6288, SmartSource $119; SmartModules $289 to $1379.** The SmartStack line of modular storage peripherals may be neatly stacked on top of a common power supply to reduce desktop clutter and cabling problems. Sep 93

★★★ **Turbo 040, DayStar Digital, 404/967-2077, $1899.** This accelerator card is equipped with the fastest 68040 chip available, and is as fast as or faster than any Macintosh in processor-intensive tasks. For the price, however, it may make more sense to trade up to a faster computer. Dec 93

VIDEO/DISPLAY

★★★ **AudioVision 14 Display, Apple Computer, 408/996-1010, $769.** Monitor integrates audio and video with built-in speakers that produce surprisingly rich, full-bodied sound. The display, while nice, is small for multimedia work. Dec 93

★★★ **Dycam Model 3, Dycam, 818/998-8008, $895.** Low-end, digital still camera is easy to use, and is a solid product if Instamatic grade gray-scale meets your image-quality requirements. Sep 93

★★★ **Editing Aces Suite, RasterOps, 801/785-5750, $3899.** Video professionals can record and play back full-screen movies in 24-bit color with 16-bit CD-quality sound with these products. Despite flaws, this package represents a step forward in QuickTime technology. Nov 93

★★★ **Lightning Effects II, Spectral Innovations, 408/955-0366, $1295.** Digital-signal-processor chips dramatically speed up some Photoshop operations with this expensive Photoshop-acceleration board. It had problems acquiring some JPEG files. May 93

★★★ **L-TV, Lapis Technologies, 510/748-1600, $349.** Interface board allows a Mac LC, LC II, or Performa to use a TV as a display. Unfortunately, a TV is a poor substitute for a monitor, so while the L-TV does its job, the setup is unsuitable for many applications. May 93

★★★★ **MovieMovie, Sigma Designs, 510/770-0100, $349.** This 7-inch NuBus video-capture board may be what you've been waiting for. The price is right, and the addition of on-board audio input is a plus, even if it is only mono. Dec 93

★★★ **PaintBoard Turbo, RasterOps, 408/562-4200, $1499.** Midrange video board supports 24-bit color on monitors up to 17 inches and resolutions as high as 1024 by 768 pixels. If you can live without changing resolutions on the fly, it's a reasonably good deal. Oct 93

★★★★ **ThunderStorm, SuperMac Technology, 408/541-6100, $699.** Photoshop-acceleration board uses digital-signal-processor chips to speed up some Photoshop operations. It's fast, with good JPEG compatibility and a great manual. May 93

★★★ **VideoToolkit 2.0.1, Abbate Video, 508/376-3712, $279.** Despite a few rough edges, this is an attractive, inexpensive solution for those who need to catalog and edit videotapes on a budget. Sep 93 m

Streetwise Shopper

SPECIAL HARDWARE AND SOFTWARE BUYING OPPORTUNITIES

Selected and edited by Charles Barrett

The following listings represent special promotions being sponsored by Macintosh vendors and their resellers. Each listing indicates which products have been awarded a star rating in *Macworld's Reviews* (products rated ★★ or lower are not eligible for inclusion), have been selected as an Editors' Choice, or have won a World-Class award. In some cases, the editorial evaluation quoted is for an earlier product version.

When placing an order, please mention that you saw the offer in *Macworld*. Should any problems arise, contact the *Streetwise Shopper* editor by fax (415/442-0766), phone (415/978-3241), or mail (*Macworld*, 501 Second St., San Francisco, CA 94107).

Vendors and resellers desiring to have products and services included in this section are encouraged to contact the *Streetwise Shopper* editor with particulars.

BUNDLES

DayMaker 3.0 + Square One 1.5.2 + CPU 2.0 + TurboNet ST + Universal NoteBook Guardian RGP is offering a $129.95 bundle consisting of Pastel Development's $129 95 DayMaker time-management software (May 93 ★★★★—"flexible printing options," "easy to customize" for version 2.0), Binary Software's $74 Square One icon-based file launcher (Aug 93 ★★★—"does what you want, when you want it"), Connectix Corp.'s $99 CPU PowerBook utility (Sep 93 ★★★★—"indispensable and reasonably priced"), Focus Enhancements' $59.95 TurboNet ST AppleTalk network connector (includes RJ-11 terminator and cable), and PC Guardian's $39.95 Universal NoteBook Guardian floppy-drive lock and steel-cable security device. Estimated street price is $99.95. For reseller information, call National Sales and Marketing at 408/774-2900. *Offer not to expire before 5/30/94.*

iMovie + Action 1.0.2 + VideoShop 2.0 SE Axion is including Macromedia's $495 Action multimedia-integration program (Mar 93 "First-Time Authoring" Editors' Choice—"powerful media-integration tools"; Feb 93 ★★★★ for version 1.0—"straightforward interface makes turning out high-quality presentations . . . a surprisingly easy process") plus a special edition (limited to 320-by-240-pixel captures) of Avid Technology's $499 VideoShop QuickTime video-editing program (Feb 94 ★★★—"shines in its intuitive, easy-to-use interface") free with its $399 iMovie digital 16-bit video-capture and 44 1kHz audio-capture board, which provides real-time hardware compression. Available through authorized Apple resellers For more information, call 800/829-4661 *Offer expires 3/31 '94*

Media Suite Pro 2.0 + NuBus 4-Slot Expansion Chassis Avid Technology is offering Second Wave's $995 Expanse NB4 expansion chassis for $495 with the purchase of its $9995 Media Suite Pro desktop video system for creating training videos, corporate presentations, and business promotions. The Expanse NB4 makes it possible to run Media Suite Pro on more Macintosh models, including the Quadra 800 and 650. Call 800/394-3482 for further information and to locate resellers. *Offer expires 3/31/94.*

Speedster Accelerator + Cache Card Mobius Technologies is offering a $200 discount and a free (normally $199) 128K static-RAM cache card to purchasers of its 33MHz and 40MHz Speedster 68040-based accelerators for 68030 Macintoshes. The 33MHz Speedster is available for $599 ($799 with FPU); the 40MHz model for $1199 (includes FPU). In addition, unbundled 25MHz Speedster boards are being discounted to $399 (from $699); and to $499 (from $899) with FPU. Call 800/800-4334 to order. *Offer expires 4/30/94.*

Thunder/24 Card + DSP Board SuperMac Technology is offering a free (normally $599) digital signal processor (DSP) daughterboard for accelerating computation-intensive image processing applications to buyers who purchase version 2 of its $1999 Thunder/24 graphics display card (Feb 93 "24-Bit Color Graphics" Editors' Choice—"offers the fastest 24-bit video-display boards you can buy") after 1/19/94. Call 800/334-3005 for more information. *Offer expires 4/30/94.*

SIDEGRADES/UPGRADES

AutoCAD Release 12 Autodesk is offering this $3750 CAD package for $995 to users of its own Generic CADD for the Macintosh, and to users of Computervision's VersaCAD Mac, Claris's discontinued Claris CAD, or any of Applicon's MacBravo series. Call 800/964-6432, ext. 908, to locate nearest authorized dealer. *Offer expires 6/30/94.*

EfiColor Works 1.0 Electronics For Imaging is offering this $399 Apple ColorSync–compatible system (which includes EfiColor for Adobe Photoshop and an EPS XTension for QuarkXPress users) for matching colors among scanners, monitors, and printers, to registered users of its Cachet, EfiColor for Adobe Photoshop, or EfiColor Profile Library, for $79. Call 800/285-4565 to order. *Offer expires 5/31/94*

Passport Producer Pro 1.1 Passport Designs is offering this $995 multimedia authoring tool that synchronizes graphics, video, sound, and MIDI sequences in a real-time desktop production environment (Apr 94 ★★★ for version 1.0—"overall, a superb [at $995]—albeit expensive—media-integration package that makes assembling even complex presentations surprisingly easy") for $495 to users of Adobe Premiere and Macromedia's AuthorWare or Director. Call 800/443-3210 to order and for proof-of-purchase requirements. *Offer not to expire before 4/30/94*

SITcomm 1.0 Aladdin Systems is offering this $120 telecommunications program for connecting to commercial online services, bulletin board services, and Internet (Apr 94 ★★★—"will do well for people who use just one or two services") for $49 to users of competing telecommunications products such as White Knight, Smartcom, MicroPhone II, and ZTerm ($39 to users of Aladdin's StuffIt Deluxe, StuffIt SpaceSaver, or StuffIt Lite). Available direct (408/761-6200). *Offer not to expire before 7/31/94.*

DISCOUNTS/REBATES/FREE OFFERS

DynaMO 128 Fujitsu Computer Products is offering the choice of a $75 rebate on the selling price of this $1025 magneto-optical drive (Dec 93 "Optical Options"), or a $300 650MB DynaMO media five-pack plus 100MB of Macromedia ClipMedia free of charge. Available through resellers, mass merchants, and mail order. For more information and proof-of-purchase requirements, call 800/626-4686. *Offer expires 4/30/94.*

MailLink Internet for PowerTalk 1.0 StarNine Technologies is offering a special introductory price on this personal-gateway software that supports System 7 Pro Macintoshes with MacTCP on a LAN by allowing users in SMTP/POP3 environments to exchange messages with Internet mail users. A $65 single-user license is being made available for $29 in specially marked boxes of Apple's System 7 Pro. Any System 7 Pro buyer can purchase the gateway by contacting StarNine directly at 510/649-4949. *Offer expires 3/31/94.*

Mr. File 2.0 Softways is offering this $99 Finder-alternative utility (Dec 93 ★★★★—"well-designed background capabilities make it a handy desk accessory for a good [list] price") for $39.95. Registered owners of CE Software's DiskTop desk accessory qualify to receive an additional $10 cash rebate, plus a free upgrade to the next version of Mr. File. Call 800/279-3453 to order. *Offer expires 4/30/94.*

Nanao Color Monitors Not only has Nanao USA reduced its display pricing, but it is also offering rebates on six models: $30 each on the $1399 F550iW 17-inch and $1599 F560iW 17-inch monitors; $50 on the $1999 T560i 17-inch Trinitron monitor; $100 each on the $1199 F550i 17-inch, $2799 T660i 20-inch Trinitron, and $2499 F760iW 21-inch monitors. Call 800/800-5202 for more information. *Offer expires 3/31/94*

Peace of Mind 1.3.3 DiagSoft is offering a special introductory price of $49 95 on this new version of its $99 95 hardware-diagnostic tool (Jun 93 ★★★ for version 1 2 2—"runs exhaustive batch, interactive, and benchmark tests on virtually all major Mac hardware components") To order direct, call 800/342-4763. (When version 2 0 is released a free upgrade will be provided to those who take advantage of this offer.) *Offer expires 3/31/94*

Santa Fe Collection Canned Art Connection is offering this $179 library of native American and Southwest clip art from RT Computer Graphics—which consists of more than 500 image files and 125 preassembled border files plus the Santa Fe font and Lookart EPS art viewer—for $129 (regularly $161) Call 800/455-4278 for further details and to order *Offer expires 4/30/94* m

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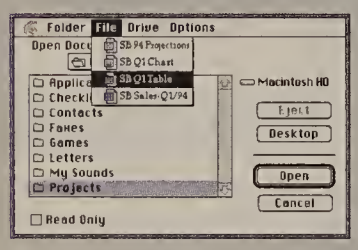

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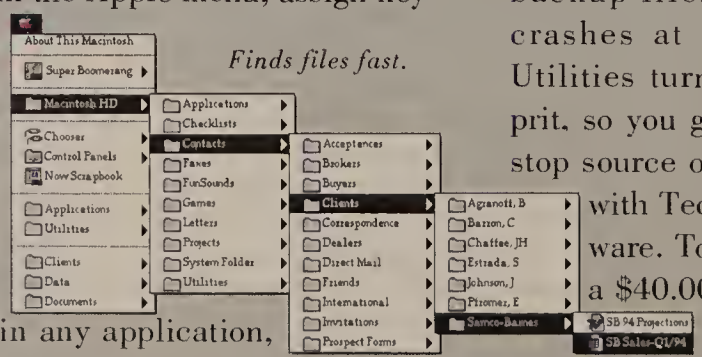

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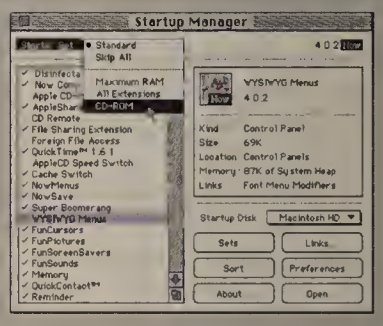

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Macworld

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Macworld

Product Index

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A. Including yourself, approximately how many people are employed at your entire work-site (i.e., employees in your office, building, or cluster of buildings)? (Check one.)

- 01 ❑ 1000+
- 02 ❑ 999 - 100
- 03 ❑ 99 - 25
- 04 ❑ Under 25

B. Which of the following computers are installed at this entire work-site? (Check all that apply.)

- 05 ❑ Apple Workgroup Servers/ Mac Quadra-series
- 06 ❑ Mac Centris-series/II-series/LC III/ Performa 600/450/SE 30
- 07 ❑ Mac LC/LC II/Performa 430/405/ 400/200/Classic-series/SE/Plus/ 512K/128K/Portable
- 08 ❑ Mac PowerBook-series/Duo-series

C. What is the total number of Macs installed at this entire work-site? (Check one.)

D. For how many Macintosh computers within this entire work-site do you have purchase involvement for products and/ or services? (Check one.)

	C	D
500+	❑ 09	❑ 15
499 - 100	❑ 10	❑ 16
99 - 50	❑ 11	❑ 17
49 - 10	❑ 12	❑ 18
9 - 1	❑ 13	❑ 19
None	❑ 14	❑ 20

E. In which ways are you ever involved in purchase decisions for Macintosh products at this entire work-site? (Check all that apply.)

- 21 ❑ Initiate/Determine need for product/capabilities/features
- 22 ❑ Evaluate, recommend, or approve brands/models
- 23 ❑ Evaluate, recommend, or approve purchase source
- 24 ❑ Authorize purchases

F. Over the next 12 months, how much will this entire work-site spend on Macintosh products and/or services? (Check one.)

- 25 ❑ $1 million or more
- 26 ❑ $999,999 – $500,000
- 27 ❑ $499,999 – $100,000
- 28 ❑ $99,999 – $50,000
- 29 ❑ $49,999 – $10,000
- 30 ❑ Under $10,000

G. Considering the entire work-site, which of the following Macintosh hardware and software products are currently installed? (Check all that apply.)

- 31 ❑ Business software (Word processing, spreadsheet, database, etc.)
- 32 ❑ Graphics/publishing software
- 33 ❑ Monitors/displays
- 34 ❑ Printers/scanners
- 35 ❑ Networking/communications hardware and/or software
- 36 ❑ Multimedia/AV hardware and/or software
- 37 ❑ Mobile computing products (PowerBooks, peripherals, software, etc.)

H. What is your primary job function? (Check one.)

- 38 ❑ Computer Reseller/VAR/VAD
- 39 ❑ MIS/DP/IS/Network Management
- 40 ❑ Engineering
- 41 ❑ R&D/Scientific
- 42 ❑ Corporate/General Management
- 43 ❑ Accounting/Finance
- 44 ❑ Marketing/Sales/PR/ Communications
- 45 ❑ Art/Design/Creative Services

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16	17	18	19	20	166	167	168	169	170
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466	467	468	469	470	566	567	568	569	570
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476	477	478	479	480	576	577	578	579	580
481	482	483	484	485	581	582	583	584	585
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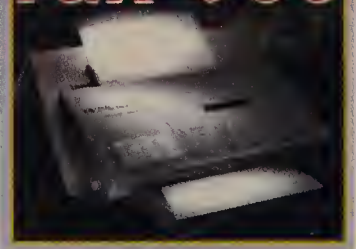

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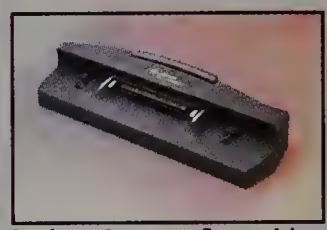

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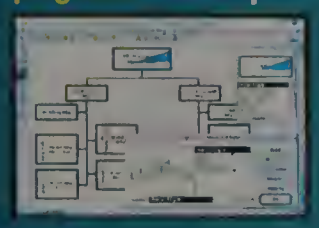

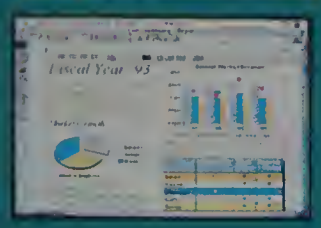

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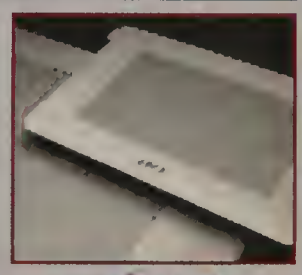

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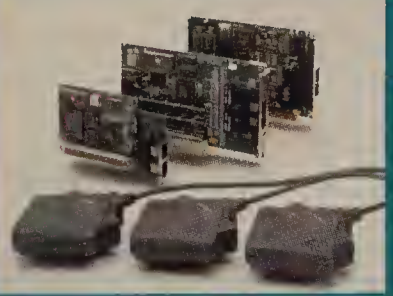

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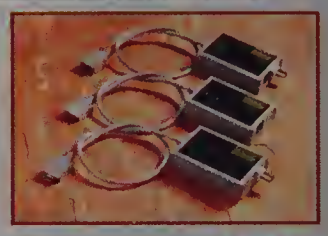

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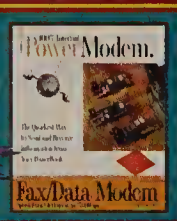

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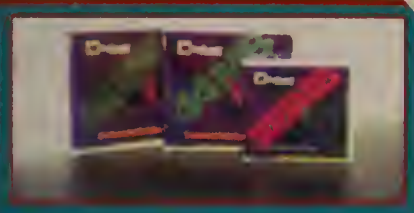

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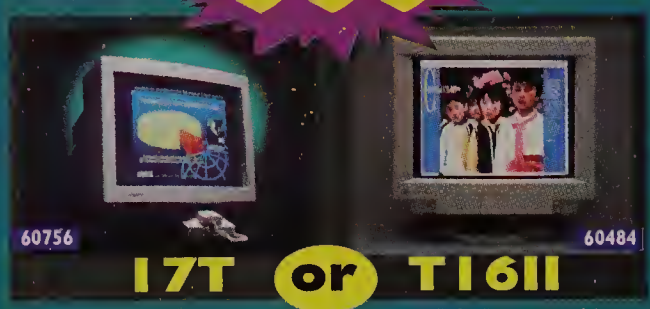

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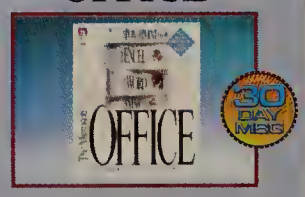

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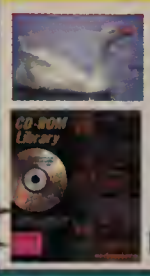

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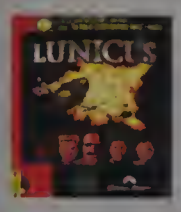

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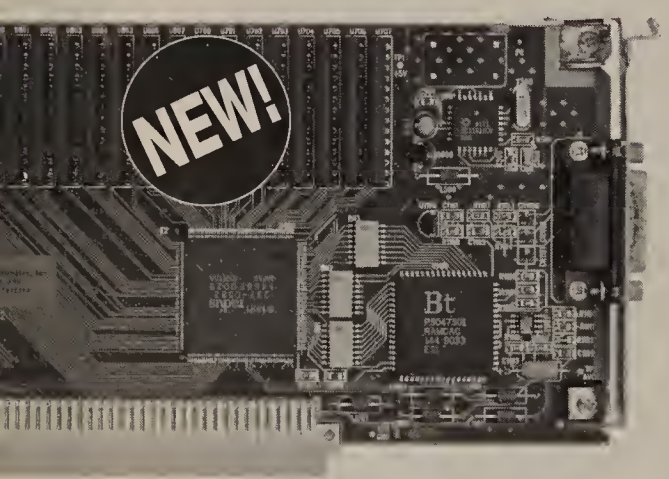

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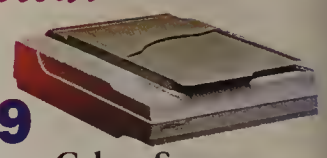

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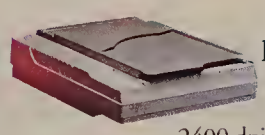

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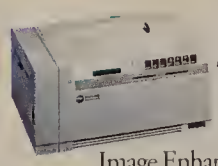

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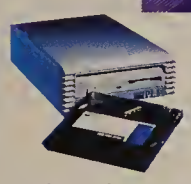

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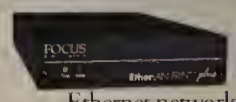

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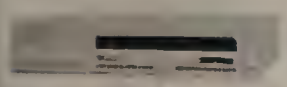

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ADOBE

Adobe Illustrator 5.0 Software

$369

Adobe Photoshop 2.5	539
Adobe Premiere 3.0	429

ALDUS

ALDUS PAGEMAKER

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Aldus FreeHand 4.0	399
Aldus Fetch	229

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Specular Logo Motion	149

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Stuff•It Space•Saver	39
Maxa Alert	99

Systems

Macintosh

Mac Quadra 610 Color Desktop Publishing System $2,099
610 w/FPU, 8 MB RAM/80 MB HD, 14" color display, extended keyboard & System 7.

• Add Apple 300 internal CD ROM drive, 1/2 MB V RAM & 5 popular CD ROM titles (including Grolier's Encyclopedia) all for only **$479**

Mac Quadra 650 Publishing System $3,699
650 w/FPU, Ethernet, 8 MB RAM/230 MB HD, 16" Color Trinitron Display, 24-bit video accelerator card, extended keyboard & System 7.

• Add GCC Eclipse 4, 300 dpi, PostScript printer for only **$879.**

Mac Quadra 660 AV Multimedia System $3,899
660 AV w/CD Rom Drive, FPU, Ethernet, 8 MB RAM/230 MB HD, 16" Color Trinitron Display, extended keyboard, System 7 & 5 popular CD ROM titles (including Grolier's Encyclopedia.)

• Add Avec 2400, 600 dpi color scanner with Photoshop LE and OCR Software for only **$599**

Mac Quadra 840 AV Multimedia System $7,999
840 AV w/CD ROM drive, FPU, Ethernet, 16 MB RAM/1 GB HD, RasterOps 20T, 20" Color Trinitron Display, Lightening 24-bit video accelerator card, extended keyboard & System 7.

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1.2GIG	3.5"	8.5MS	$ 850	$ 910
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2.2GIG	5.25"	12MS	WREN 9	$ 1515
2.4GIG	3.5"	9MS	ST12400N	$ 1555
2.0GIG	3.5"	8MS	Barracuda 1	$ 1585
2.5GIG	3.5"	8MS	Barracuda 2	$ 1855
2.5GIG	3.5"	8MS	WIDE	CALL
3.4GIG	3.5"	10MS	Elite 3	$ 2195

HITACHI — 5 YEAR WARRANTY

CAPACITY	SIZE	ACCESS	INTERNAL	EXTERNAL
1.2GIG	3.5"	11.8MS	$ 899	$ 959
1.6GIG	3.5"	11.8 MS	$ 1239	$ 1299
3.7GIG	5.25"	12.8 MS	$ 2295	$ 2395

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1.0GIG	Panasonic	90MS	$ 1999
1.3GIG	Sony	40MS	$ 2299
1.3GIG	Tahiti 3	19MS	$ 2799

CD ROMS

1 YEAR WARRANTY

Toshiba 4401	$ 320
Toshiba 3401	$ 439
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Ricoh Playwright 1000 Recordable CD Make your own!	$ 3899

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1.3-2GIG	Archive 4320*	4MM	$ 939	$ 999
1.3-8GIG	Archive Turbo*	4MM	$ 1139	$ 1199
1.3-5GIG	Exabyte 8205	8MM	$ 1539	$ 1599
1.3-10GIG	Exabyte 8505	8MM	$ 2179	$ 2279
4.0-8GIG	Sony 4000	4MM	$ 1089	$ 1149
4.0-8GIG	Sony 5000 DDS-2	4MM	$ 1189	$ 1249

MEDIA

60M	Tape	$ 10	128MB	Optical	$ 35
90M	Tape	$ 12	650MB	Optical	$ 79
112M	Tape	$ 18	1.0GIG	Optical	$ 79
120M	Tape	$ 22	1.3GIG	Optical	$ 105

RAID SYSTEMS

1.0 GIG	RAID	$ 1499
2.0 GIG	RAID	$ 2199
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$86. Adesso Extended Keyboard

All keyboards are equal – NOT! Compare the membrane key switch other companies use to the ALPS Mechanical Switch used by Adesso. A membrane switch feels mushy, and if one contact is damaged, the entire keyboard must be replaced. In contrast, the mechanical switch used by Adesso offers a lively, tactile response, and each switch operates independently. You can see quality as well in the intelligent 105-key layout. Dual Control, Option, and Command keys; 15 macro storage keys; separate numeric and cursor keys; an enlarged return key; and many more features make the Adesso Extended Keyboard a pleasure to use.

Adesso

7607 Adesso Extended Keyboard

$48. Cal

It talks! And if you have an AV Mac, it listens, too. This CALculator and CALendar utility repeats your input so you can catch mistakes immediately. Calculator features include scrolling print tape, scientific and programmer functions, and a parse-editor for nested expressions. Use the calendar to schedule recurring events and reminders. Fully customizable appearance.

Minimum requirements: Mac Plus, 1MB RAM, System 6.0.4.

Thought I Could

7605 Cal

$88. Microsoft Encarta

This interactive multimedia knowledge bank starts with the 29-volume Funk & Wagnalls Encyclopedia, and adds a dazzling collage of sounds, illustrations, video clips, maps, and charts. Thousands of pages of vivid information engage researchers of all ages. You'll create spectacular documents by pasting words, graphics, and more from Encarta.

Minimum requirements: Color Mac II, Color Classic, or PowerBook; System 7; 4MB RAM; 3MB free hard disk space; CD-ROM drive.

Microsoft

5645 Microsoft Encarta Microsoft

$448. Microsoft Office

Microsoft Office is a great deal – the full versions of the latest Microsoft Word, Excel, PowerPoint, and Mail for over $1,000 less than if you purchased them separately. These are heavy-duty word-processing, spreadsheet, presentation, and e-mail programs – everything you need for office productivity. And they were designed to work together, so you can import and export data and graphics from one to another with ease. Each uses the same kind of Toolbar commands, so once you're familiar with one program, you're well on your way to knowing them all. The CD-ROM version has the complete documentation on-line, so you'll never have to flip through a manual.

Minimum requirements: Mac Plus, 2MB RAM, System 6.0.5, a hard disk, CD-ROM drive for CD-ROM edition.

Microsoft

5645 Microsoft Office 3.0 (pictured)

5688 Microsoft Office 3.0 CD-ROM .....$448.

Microsoft

$48. Square One 2.0

Stop wasting time rummaging through your hard drive. Square One gives you lightning access to all of your favorite files and programs with an easy-to-use icon palette. Design your own icons, and group files and programs for one-touch starts. Square One automatically adds your most recently opened documents to your palette. Just point, click, and you're off and running.

Minimum requirements: Mac Plus, 2MB RAM, System 7.

Binary Software

7368 Square One 2.0

The Great Bloopers Giveaway!

Bloopers is the silliest little tidbit that ever took up residence in your system. Laugh as the menubar eyeballs follow your cursor. Cringe as farm animals and body sounds cut loose. Lots more biffs, gags, and practical jokes to brighten your day.

Minimum requirements: System 7.

7325 Bloopers

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With WordPerfect's 125,000 word multi-language dictionary and thesaurus, you'll always be able to find that perfect word. But communicating effectively today requires more than just words. QuickTime movies, a powerful drawing package that handles millions of colors, a new Tables feature (with up to 32,000 rows and 32 columns), and an Equation Editor allow you to say what you want any way you want. Of course, WordPerfect makes it easy with features like Drag 'n' Drop editing. Ruler bars make style and layout formatting simple, Button bars make finding functions quick and easy, and a complete macro language allows the automation of tasks. Includes Grammatik 5 FREE.

Minimum requirements: Mac Plus, 2MB avilable RAM, System 6.0.7, hard drive, 4MB RAM under System 7.

WordPerfect

6681 WordPerfect 3.0 (pictured)

6874 WordPerfect 3.0 Competitive Upgrade .....$78.

WordPerfect macintosh

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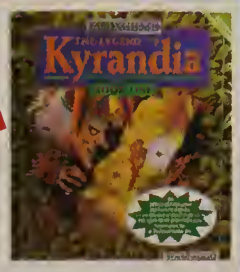


$45.

The Legend of Kyrandia

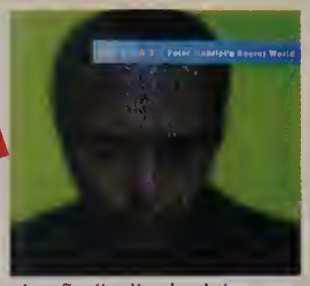
This first chapter in the new Fables and Fiends series will plunge you into an intriguing realm of fantasy and magic. Search mysterious caverns, cast spells, collect gemstones, and chase leprechauns. It's so engaging with its digitally recorded speech, brilliantly rendered graphics, captivating soundtrack, and point-and-click interface that you won't want to leave.

Minumum requirements: Mac LC, System 6.0.7, 12" 256-color monitor; 4MB free hard disk space, CD-ROM drive.

Virgin Games

7413 The Legend of Kyrandia

New!



$48.

Xplora 1 Peter Gabriel's Secret World

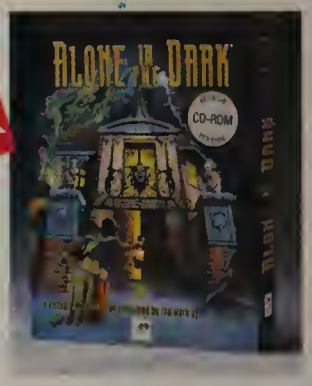
Peter Gabriel's immense talent has finally dissolved the boundary between performer and audience, and *you* are there. Travel with Peter on an interactive musical journey with an itinerary that's entirely in your control. Go backstage at a concert; play along in an impromptu jam session; take control of the mixing board to create your own versions of "Digging in the Dirt;" explore Peter's life and his newest album performance, US; and learn more about the rhythms and instruments of world music. This incredible CD-ROM package includes a special collectors edition book, 140 minutes of video and audio, 100 full color photographic images, and a book's worth of text.

Minimum requirements: Any color Mac, 4MB RAM, System 7, 2MB hard drive space, a CD-ROM drive.

MacPlay

7456 Xplora 1

New!



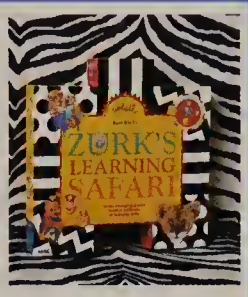
$35.

Alone In The Dark

Your exploration of the house, and the terror within, begins with a piano in the attic. As you fight room after room of horrors, the evil of the late Jeremy Hartwood's mansion begins to twist your mind with panic. The torturous howls, the brooding darkness. Hartwood's suicide seems less perplexing as you unravel his fear-filled descent into madness. Alone In The Dark is so involving, it will actually quicken your pulse, coaxing you late into the night. You freely and actively explore the house, interacting with the demons you face. Amazing 3D rooms with up to 9 camera angles, true suspense, and fights to the death charge the intensity.

MacPlay

7537 Alone In The Dark



$39.

Zurk's Learning Safari

The joy of discovery is the pleasure of learning! Children 3 to 7 will love playing games of hide-and-seek, solving puzzles, and exploring magic boxes with "cool" Zurk and Maya the baby lion. This interactive whole-mind learning program turns childrens' natural curiosity into valuable math, science, and reading skills.

Minimum requirements: Mac with 4MB RAM, System 6.0.7, 256-color monitor, and 7MB free hard disk space.

Knowledge Adventure/Soleil

7599 Zurk's Learning Safari

$38.

Kids Studio

This exciting, all-in-one multimedia program gives kids all the tools they need to create and star in their own full-screen presentations, QuickTime movies, or printed stories. It's easy to use, yet incorporates features like sound recording, a paint window with 256 colors, support for Photo CDs, and a Treasure Chest library of high-quality images.

Minimum requirements: Mac LC, 4MB RAM, System 7.0, 256 – color 12" monitor, 7MB available hard disk space.

Maxis

7436 Kids Studio

$27.

The Lost Treasures of Infocom

Here's an adventure gamer's dream collection, chock-full of Infocom's best-ever mystery, fantasy, and science fiction games! Volume I includes the Zork series, Planetfall, Deadline and more – 20 great titles in all. Volume II adds 11 more including Sherlock, Border Zone, and Wishbringer. These interactive challenges put your problem-solving skills to the test. You'll be captured for hours – days – weeks – by spine-tingling suspense, belly-rocking comedy, and brain-teasing puzzles galore. Each Volume contains hundreds of dollars worth of incredible games. Add both collections to your personal library of software treasures!

Minimum requirements: Mac 512K, System 6.0.

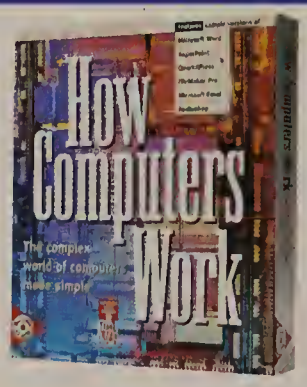
Activision

7597 The Lost Treasures of Infocom I

7598 The Lost Treasures of Infocom II $17

$54.

How Computers Work



Have fun while you learn in this interactive look at the past, present, and future of the desktop miracle. How Computers Work features narrated slide shows on input, output, memory, programming, and applications. QuickTime animation takes you inside every device from the mouse to the memory cells of a CPU. It also includes tutorials for the most popular programs on the market today including Word, Excel, Quark XPress, FileMaker Pro, Audioshop, and SuperPaint. And your children can easily learn the basic of programming using the included Logo programming tutorial, designed expressly for children.

Minimum requirements: Mac LC, System 6.0.7, 4MB RAM, 13" color monitor, CD-ROM drive.

Time Warner Interactive Group

5987 How Computers Work

Mac's Place carries Time Warner's entire line of CD-ROMS.

$29.

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Crystal Caliburn

Any Pinball Wizard will "flip" for Crystal Caliburn! This is pinball excitement like you've never seen on a computer. Your quest for knighthood is full of surprises and great scoring opportunities. Accolade all twelve knights and then go for the Holy Grail. This is "Everything Lit" for you pinball fanatics! A contest feature allows you to submit an authorized score to compete with anyone in the world! And it includes all the advanced features of the best pinball machines including nudge, tilt, battle sounds, voices, 3-D ramps, 3 multiball, autobattle, flashing bumpers, contest feature, and more. Crystal Caliburn was developed by the same people behind Tristan and Eight Ball Deluxe.

Minimum requirements: Any color Mac w/13" or larger monitor, 4MB RAM, System 6.0.7.

StarPlay Productions Inc.

7080 Crystal Caliburn

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PhotoFlash

Apple PhotoFlash software is a page-layout companion that enables you to quickly and easily acquire photos, enhance them, and place them in your documents. An integrated browser simplifies image selection, and automatic photo-enhancement tools allow you to remove dust and scratches, balance image exposure, and make every image picture-perfect. Automatically place photos in popular page-layout programs like QuarkXPress and Aldus PageMaker with built-in AppleScript support and several ready-made scripts. PhotoFlash offers integrated image-compression capabilities and low memory requirements. That means even modest computer configurations can now handle storing, enhancing, and placing photos.

Minimum requirements: Any Mac with a 68020 processor, 8MB RAM, System 7.0.

Apple Computer

7431 PhotoFlash

$648.

Lightning Effects ME

This is the fastest Adobe Photoshop filter and effects acceleration card available. You can resize and rotate images with lightning speed! The Dual AT&T DSPs run the Adobe Systems AV DSP Power Plug-In code, giving your Mac the same power as the AV Macs, at twice the speed. Accelerate filters and effects, including Gaussian Blur, Sharpen Edges, Despeckle, Emboss, Fragment, High Pass, Unsharp Mask, CMYK/RGB mode change, Blur More, and much more! Lightning Effects ME also works with Video Fusion and Fractal Painter X2.

Minimum requirements: PDS slot in Quadra 700, 900, 950 and 800.

Spectral Innovations

7459 Lightning Effects ME

$359.

FREE Streamline 3.0 with Illustrator!

Adobe Illustrator 5.0 & Streamline 3.0

What a combination! Adobe Illustrator 5.0 gives you the powerful tools used by graphic artists around the world to create award-winning ads, illustrations, packaging, and logos. The program's intuitive interface, precise control, and superior text handling will help you elevate your own ideas to the status of fine art. And now, Streamline 3.0 gives you unlimited access to an infinite selection of printed images by converting scanned photos and illustrations into PostScript line drawings. Convert logos, photos, or your own pencil-sketched brainstorms. Then use Illustrator to edit and refine as your inspiration demands. The power of professional graphic design is yours with Illustrator and Streamline.

Minimum requirements: Illustrator 5.0 – Mac with a 68020 or greater processor, 3.1MB RAM, System 6.0.7. Streamline 3.0 – Mac with a 68020 or greater processor, System 6.0.7, 2MB available RAM, hard drive.

Adobe

7521 Adobe Illustrator 5.0 & Streamline 3.0 (pictured)

Adobe

$134.

Smart Label Printer Plus

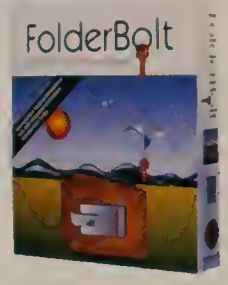
The Smart Label Printer Plus saves you considerable time over printing envelopes or labels on your regular printer. Print personalized labels or mailing lists from your applications, right at your desk. The integrated software works as a desk accessory with WYSIWYG screens and background printing. It includes everything you need – software, power supply, printer cable, and a roll of labels.

Minimum requirements: Mac Plus, 1MB RAM.

Seiko Instruments

5676 Smart Label Printer Plus

$72.



FolderBolt

A natural extension of the Mac Desktop you use every day, FolderBolt is the lock-down answer to your data security questions. Completely locked, read-only, and one-way drop box folders protect your valuable information three ways. And you can custom configure any operation you choose. Works on all types of hard drives, including removables.

Minimum requirements: System 6.0.4.

Kent Marsh

3978 FolderBolt

$279.

Claris MacDraw Pro with Action! Mouse

$175.

Claris MacWrite Pro with Action! Mouse

Words, pictures, and the means to manipulate them – that's what you get with these great new bundles from Pointex. The sleek, two-button, 400 dpi optomechanical Action! Mouse is the perfect replacement for your clunky, old, one-button varmint. And choose a great deal on one of the two classic programs that launched the Mac revolution. Newly updated for power and ease of use, MacDraw Pro 1.5 elevates your graphic creations to a new level of sophistication with QuickTime, TrueType, 4-color separations, and advanced graphic tools. And MacWrite Pro propels your verbal communications to greater effectiveness with tables, graphics, sound, and complete DTP capabilities.

Minimum requirements: Mac SE, hard disk drive, 1MB RAM, System 6.0.5.

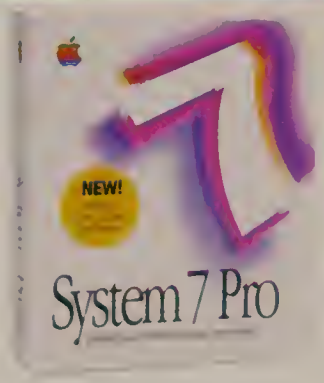
Pointex

7616 MacDraw Pro 1.5 with Action! Mouse

7617 MacWrite Pro with Action! Mouse

Bundle

$98.*



System 7 Pro

Three powerful new extensions in System 7 Pro give you the tools to work at your best. PowerTalk makes communicating and sharing information as easy as point and click. Share text, picture, or video documents. Communicate by fax, modem, or over a network. Your contacts will be as close as your PowerTalk catalog. Then use AppleScript to convert complex command sequences into simple one-button actions – across multiple applications! It's the easy and simple route to productivity. Finally, you'll be using the new QuickTime 1.6 for sophisticated video and sound communications. Watch your presentations and documents come alive!

Minimum requirements: 4MB RAM (5MB recommended), hard drive, Apple SuperDrive floppy drive.

Apple

6797 System 7 Pro

6798 System 7 Pro Multi Pack 10 User $948*

***Special price offer expires 4/15/94.**

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- CD-ROM Product
- Works with your PowerBook

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SupraFAXModem V.32bis MacPac

"The SupraFAXModem V.32bis is an excellent value," raves Tom Negrino of *Macworld*. It features 14,400 bps data and fax communications with up to 57,600 bps throughput using V.42bis data compression. The modem automatically negotiates the fastest connection, and sending a fax is as easy as printing. You can even delay transmission until times when long-distance rates are lower. The Silent Answer feature detects if an incoming call is fax or voice, and handles it appropriately. The MacPac includes cables, FaxMania, and WorldLink, FREE. FaxMania is a collection of fun cover sheets, and WorldLink lets you connect to the Internet.

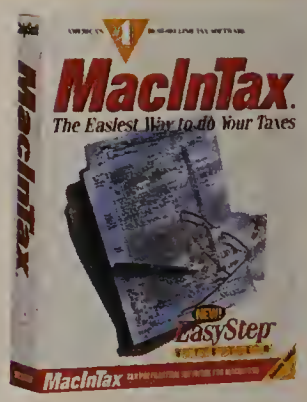
Supra Corporation

4017 SupraFAXModem V.32bis MacPac
6651 SupraFAXModem 144 LC ..... $164.
5575 SupraFAXModem 144 PB ..... $219.

Supra Corporation

$39.

MacInTax



Tax preparation without the headaches! MacInTax makes preparing your taxes easier, faster, and more accurate than ever before. Only MacInTax has EasyStep, which leads you through your tax return from start to finish, guiding you every step of the way. MacInTax contains everything you need to do your taxes quickly and accurately – over 90 forms, schedules, and worksheets; complete IRS instructions; tax help in plain English; and itemizations. You can even print an IRS-approved form on most printers. Or, get MacInTax and Quicken together and stay on top of your finances year-round.

Minimum requirements: Mac Plus, 1MB RAM, floppy drive, System 6.0.5, and a hard disk. Supports color and monochrome monitors.

Chipsoft

7226 MacInTax Final (pictured)
7227 MacInTax/Quicken Bundle ..... $54.

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ATTENTION PARENTS! This fun, interactive guide combines animation, illustrations, sound effects, and text to cover parenthood from prebirth to age 5. Explore Family Profile to help "predict" your child's looks or determine potential risks. Medical Records with electronic growth charts, "Biological Clock," Pregnancy Timetable, and much more make this the most comprehensive parents' program available.

Minimum requirements: Any Mac with 1MB RAM, System 6.0.5, hard drive.

Atlantis

6991 ReadySetGrow!

$49.

FLOWERscape

Plan a perfect flower garden. Just tell the program where you live, and it recommends suitable plants for your garden. Then point, click, and drag beautiful photos into your computer garden. You can actually view your garden's growth in color, as it would appear in any month of the year. FLOWERscape is easy to use, so it's great for the whole family.

Minimum requirements: Any 256-color Mac with a high-density floppy drive, 1.5MB RAM, System 6.0.4, 8.5MB hard disk space.

Voudette

6701 FLOWERscape for Mac

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Minimum requirements: English/French and English/Spanish Versions – System 6.0.5. English/Japanese version – System 7.1 and Apple Japanese Language Kit, or KanjiTalk 6.0.5.

Language *Engineering*

6973 Ambassador English/Japanese (pictured)
6974 Ambassador English/French ..... $229.
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- Mac's Place is open from 7 a.m. to 12 midnight M-F Mountain Time, and 6 a.m. to 9 p.m. on Sat., and 7 a.m. to 7 p.m. on Sun.
- No sales tax (except OH residents add 6% to total, including shipping).
- VISA, MasterCard, Discover Card, American Express, OPTIMA, checks, and P.O.s gladly accepted. Your credit card is never charged until your product ships.
- All in-stock items ship same-day, (barring system failure, etc.) to your doorstep, for just $3 (USA) via Airborne Express overnight service. Rural locations may require an additional day for delivery. Areas not serviced by Airborne Express will be sent via Priority Mail.
- Our $3 shipping charge includes insurance at no extra charge.
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- Many products carry a money back gurarantee (MBG).
- Defective software is replaced immediately with like items. Defective hardware items repaired or replaced at our discretion.
- We reserve the right to revoke money back guarantee privileges.

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HyperCard 2.2

Creating custom applications is easier now than ever before! And with HyperCard's new color support, good looking applications are a button-click away. Ready-made templates, buttons, and scripts help you assemble creative point-and-click applications in record time. To satisfy your standards for professional-looking creative design, import PICT images and apply color to make your stack come alive with graphic energy. Then, when you're done, use the new Standalone Builder to save it as an independent application that runs without HyperCard. Plus, through the magic of AppleScript, your applications will be able to launch, control, and exchange data with dozens of other off-the-shelf, scriptable applications.

Minimum requirements: Mac Plus, 2 MB RAM (4 MB - System 7), System 6.0.5, a high density floppy drive, and a hard disk.

Apple

7592 HyperCard 2.2

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ScanMaker IIxe/AV	24-bit Color 600x300 dpi	$1,149/999
ADF	For 600/Scanmaker II	$399
Transparency AV	For Scanmaker II/IIxe	$599/399
SCANNING SOFTWARE		
Adobe Photoshop Limited Edition		$199
Adobe Photoshop Full Version		$399

SALE

Hard Drives

Fujitsu

Capacity	Description	Internal	External
520MB	3.5" HH 9ms	$549	$609
1200MB	***3.5" HH 9ms***	***$939***	***$999***
2400MB	5.25" FH 11.5ms	$1,628	$1,728

Fujitsu Drives carry a 5 year warranty

Quantum

Capacity	Description	Internal	External
170MB	2.5" Notebook 17ms	$245	$345
85MB	3.5" LP 17ms	$135	$195
170MB	3.5" LP 17ms	$180	$240
240MB	3.5" LP 10ms	$235	$295
270MB	3.5" LP 10ms	$275	$335
540MB	***3.5" LP 10ms***	***$549***	***$609***
1000MB	3.5" HH 10ms	$895	$955
1200MB	3.5" HH 10ms	$995	$1,055
1800MB	3.5" HH 10ms	$1,219	$1,279

Go Drives carry a 1 year warranty / The rest carry a 2 year warranty

Seagate

Capacity	Description	Internal	External
1200MB	3.5" HH 10.5ms	$919	$979
2100MB	3.5" HH 8ms	$1,935	$1,995
2400MB	5.25" FH 11ms	$1,715	$1,815
3400MB	***5.25" FH 11ms***	***$2,150***	***$2,250***

Seagate Drives carry a 1 year warranty

Maxtor

Capacity	Description	Internal	External
245MB	3.5" LP 10ms	$240	$300
345MB	3.5" HH 10ms	$359	$419
540MB	3.5" HH 8.5ms	$699	$759
1200MB	***3.5" HH 8.5ms***	***$1,199***	***$1,259***

Maxtor 3.5" Drives carry a 1 year warranty
5.25" Drives carry a 2 year warranty

SALE

Half Height Enclosure	$69
Full Height Enclosure	$99
Formatting Software	$19

SyQuest Drives

Model	Internal	External
SyQuest 270	***$519***	***$599***
SyQuest 105	$389	$449
SyQuest 88C	$309	$369
SyQuest 44	$199	$239

Cartridges

105MB Cartridges *(5+ or with drive Purchase)*	***$59.99***
88MB Cartridges (5+ or with drive Purchase)	$89.99
44MB Cartridges (5+ or with drive Purchase)	$59.99

Includes external drive, 25/50 SCSI Cable, Mac SW, and Terminator

SALE

Tape Drives

Model	Capacity	Size	MacKit
Archive Viper 250	250MB	3.5"HH	$499
Archive Viper 525	500MB	3.5"HH	$699
Sony SDT-2000	2Gbyte	3.5"HH	$919
Sony SDT-5000	***5-16Gbyte***	***3.5"HH***	***$1,349***
Exabyte 8200	2Gbyte	5.25"FH	$1,299
Exabyte 8500	5Gbyte	5.25"FH	$2,199
Exabyte 8205	2-5Gbyte	5.25"HH	$1,625
Exabyte 8505	5-10Gbyte	5.25"HH	$2,375

Includes external drive, 25/50 SCSI Cable, MAC Softbackup II, and Terminator
Retrospect 2.0: Add $75

Tapes

Sony DAT .....$22 Maxell 8mm.....$19

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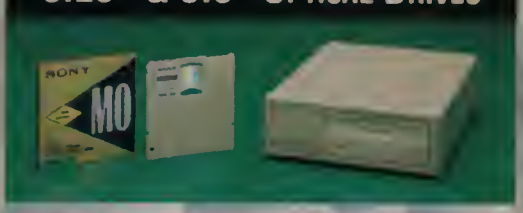
5.25" & 3.5" Optical Drives



5.25" Optical Drives

Model	Capacity	Seek	MacKit
Sony-E502	594/650mb	66ms	$2,049
Ricoh-9200EX/Eii	594/650mb	35ms	$1,849/1499
MaxOptix-Tahiti II/III	594/650/1gb	25ms	$2,599/3199
PLI 1.3GB	594/650/1.3GB		$2,999
PMO-650	594/650mb	19*ms	$2,699
PMO-1.3	***594/650/1.3GB***	***25ms***	***$2,999***

Includes external drive, 25/50 SCSI Cable, Mac SW, and Terminator

Cartridges

Sony 594/650MB as LOW as	$119
3M 594/650MB as LOW as	$109
1.3 GB as LOW as	$139

No One Has A More Complete Family Of 5.25" Rewritable Optical Drives than SuperMicro

3.5" Optical Drives

Model	Capacity	Seek	MacKit
TEAC/RICOH	128mb	35ms	$689
Fujitsu-128	128mb	30ms	$869
Sony-P301	128mb	35ms	$1,049
Most-256	128/256mb	37ms	$1,199

Includes external drive, 25/50 SCSI Cable, Mac SW, and Terminator

Cartridges

Sony 128MB as LOW as	$45
Komag 128MB/OEM as LOW as	***$33/29***

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CD-ROM Drives

Kodak Compatible

Model	Description	MacKit
Texel 3028		***$399***
CD-Bundles	100's Available	$CALL
PM CDR	CD-ROM Recorder	$3,499

Includes external drive, 25/50 SCSI Cable, Mac SW, Caddy, and Terminator

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Printers

Model	Description	Price
Texas Instruments		
MicroLaser PRO 600	600dpi, 9ppm, RISC, 8.5x11	$1339
Dataproducts		
LZR-965, 1 Tray	400dpi, 15ppm, RISC, 11x17	$1779
LZR-1560, 1 Tray	400dpi, 15ppm, RISC, 11x17	$2,899
LZR-1580	400dpi, 15ppm, RISC, 11x17	CALL
NewGen 660B	***600dpi, 9ppm, RISC, 11x17***	***$3,799***
NewGen 1200	1200dpi, 9ppm, RISC, 11x17	$4,899

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Model	Description	Price
Q950 8/245	17" Monitor X Keyboard	$4,189
Q950 8/245	14" Monitor X Keyboard	$3,969
Q840AV 8/230	17" Monitor X Keyboard	$4 149
Q840AV 8/230	14" Monitor, X Keyboard	$3 859
Q840AV 8/230-CD	***17" Monitor, X Keyboard***	***$4,529***
Q840AV 8/230-CD	14 Monitor X Keyboard	$4,249
Q660AV 8/230	17" Monitor, X Keyboard	$2 929
Q660AV 8/230-CD	14" Monitor, X Keyboard	$2 890
Q800 8/230	17" Monitor, X Keyboard	$3 029
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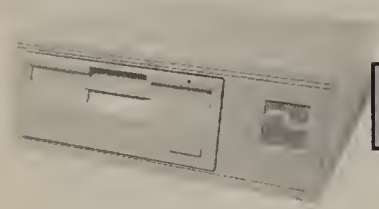

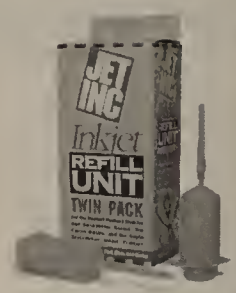

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Quadra 950 8/0	$3,395.00
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Asante 10T Friendlynet	$59.00
Asante 10T Hub/8	$219.00
Starnet Ethernet Card	$97.00
Starnet 8 10BT Hub	$199.00
Dayna Etherprint Plus	$399.00
Dayna Pathfinder	$575.00
Farallon Etherwave	$99.00
Farallon Timbuktu 5.0	$119.00

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Apple Laser Pro 630	$2,175.00
Apple Laser Pro 810	$4,599.00
TI Pro 600 PS65	$1,525.00
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Sony 14	$599.00
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Nec 3/4/5/6	Call

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Microtek 45T	Call
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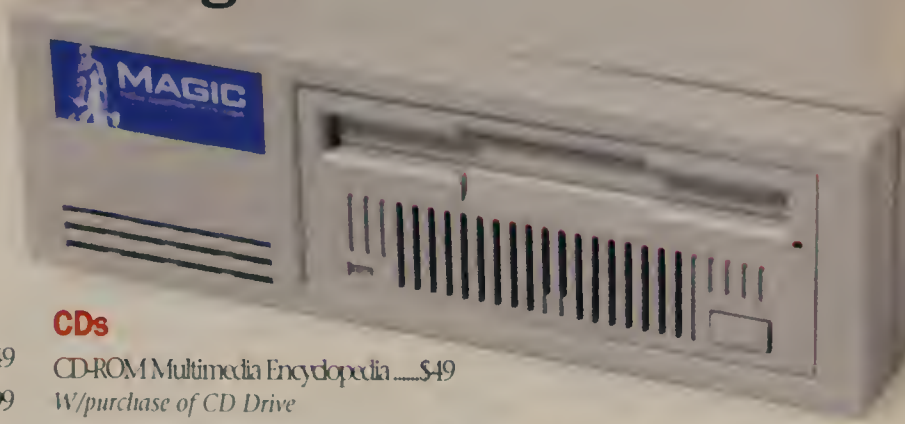

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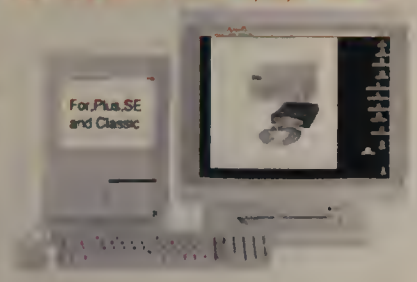

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68030 RailGun 16MHz	$279	$299
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68030 RailGun 33MHz	$399	$499
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*All prices quoted for SE version. Call for pricing on Classic or Plus version

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Quantum ELS	127	170		
Quantum Go	85	127	170	256
Quantum LPS	240	270	340	525
Quantum PRO	700	1225	1800	
Empire	580	1080		
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Barracuda	1900	2500		
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24 hour turn around backed with 1 year warranty.

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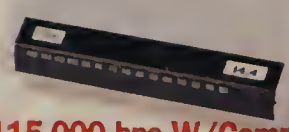

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Magic FaxModems

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M44MW

Circle 175 on reader service card

1-800-258-2622 CLUBMAC 1-800-258-2622 1-800-258-2622

Quantum

ClubMac 30 DAY MONEYBACK GUARANTEE

A ClubMac Quantum Drive is the best "plug-and-play" storage solution for your Macintosh computer. All Quantum drives are backed by ClubMac's 30-Day Money Back Guarantee and TWO Year Warranty (Go•Drives include ONE Year Warranty).

GO•DRIVE SERIES

2.5" POWERBOOK DRIVES

Capacity	Access	Internal	External
85mb	17ms	$199	$319
127mb	17ms	$235	$355
170mb	17ms	$259	$379
256mb	17ms	$339	$459

External Go•Drives come in battery powered case as shown

QUANTUM DRIVES

3.5" LOW PROFILE, LOW POWER

Capacity	Access	Internal	External
170mb	17ms	$195	$255
3.5" LOW PROFILE			
270mb	11ms	$239	$299
340mb	11ms	$289	$349
525mb	10ms	$479	$539
1080mb	11ms	$889	$949
3.5" HALF HEIGHT			
1800mb	10ms	$1159	$1219

POWERBOOK DRIVES

GO•DRIVE SERIES
The Quantum Go•Drive Series are fast, lightweight, advanced 2.5-inch hard disk drives. Go•Drives are perfect for use with Apple PowerBooks with available capacities from 85MB to 256MB.

ELS, LPS AND PRODRIVE SERIES
The Quantum 3.5-inch hard disk drives are the optimal storage solution for entry level Macintosh systems to arrays of high-end workstations and network file servers. Available capacities from 127mb up to 1800mb. Quantum drives offer average seek times at low as 10ms, transfer rates up to 10 MB/sec, and SCSI-1/SCSI-2 interface. Performance enhancements include Quantum's Proprietary DisCache and WriteCache firmware.

FUJITSU

ClubMac 30 DAY MONEYBACK GUARANTEE

FIVE YEAR WARRANTY

Unformatted Capacity	Model	Description	Access Time	Actual MAC Capacity	Internal	External
520mb	M2624	3.5" Half Height	9ms	496mb	$489	$549
1.2GIG	M2694	3.5" Half Height	8.5ms	995mb	$899	$959
2.4GIG	M2654	5.25" Full Height	11.5ms	2000mb	$1389	$1489

Seagate

ClubMac 30 DAY MONEYBACK GUARANTEE

Seagate 5.25-inch full height drives are available in capacities ranging from 1.6 gigabytes to 3.4 gigabytes. These drives feature and ave. seek time as low as 11ms, 256KB cache buffer, rotational speed up to 5,400 RPM, SCSI-2 interface, 200,000 hour MTBF and ONE Year Warranty

Unformatted Capacity	Model	Description	Access Time	Actual MAC Capacity	Internal	External
3.5" LOW PROFILE						
1.2GIG	ST31200N		10ms	1000mb	$889	$949
3.5" HALF HEIGHT						
1.2GIG	ST11200N		10.5ms	1000mb	$869	$929
1.9GIG	ST11900N		9ms	1600mb	$1199	$1259
2.4GIG	ST12400N		9ms	2000mb	$1599	$1659
1.9GIG	ST11950N	*Barracuda 1*	8ms	1650mb	$1549	$1609
2.4GIG	ST12550N	*Barracuda 2*	8ms	2050mb	$1829	$1889
5.25" FULL HEIGHT						
2.4GIG	ST42400N	*Elite-2*	11ms	2050mb	$1739	$1839
3.4GIG	ST43400N	*Elite-3*	11ms	2750mb	$2159	$2259

FEATURING

SyQuest® REMOVABLE TECHNOLOGY

ClubMac 30 DAY MONEYBACK GUARANTEE

	Internal	External
ClubMac 44mb	$259	$299
ClubMac 88c	$385	$425
ClubMac 105mb	$359	$399
ClubMac 270mb	$619	$659

CARTRIDGES

44mb/105mb	$59
88mb	$89
270mb	$99

3.5" DUAL REMOVABLES

Dual 105mb	$729
Dual 270mb	$1179
Dual Combo 105/270*	$1029

5.25" DUAL REMOVABLES

Dual 44mb	$549
Dual 88c	$649
Dual Combo 44/88c*	$729

* Dual Combos come with both types of media

All SyQuest drives include a TWO Year Warranty, SCSI Director formatting software, and necessary cables for "plug-and-play". All SyQuest cartridges include a ONE Year Warranty.

DAT BACKUP *by* CLUBMAC

CLUBMAC DAT *DDS & DDS-DC DRIVES*

provide up to 5.0 gigabytes of cost effective and highly reliable data storage on a pocket size Digital Audio Tape (DAT) cassette. Available in 2 models: ClubMac DAT using the DDS tape format and the ClubMac DAT/DC with the efficient DDS-DC compression format. They are ideal for hard disk backup, archival storage, data file distribution.

- 20 sec average data access time (60m tape)
- 14mb/min backup rate, 180KB/sec transfer rate
- MTBF of 60,000 hours • TWO Year Warranty
- Includes RetraSpect v.2.0 BackUp Software and ONE 90m Tape Cassette

FREE RETROSPECT V2.0 BACKUP SOFTWARE ($139 VALUE)

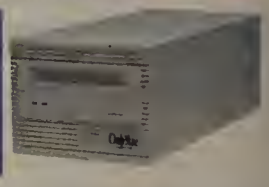
Capacity	Model	Format	Media	Internal	External
2.0GIG	ClubMac DAT	DDS	60m, 90m	$749	$799
2-4GIG	ClubMac DAT/DC	DDS-DC	60m, 90m	$999	$1049

CLUBMAC DAT/2 *DDS-2 DRIVE*

provides up to 8.0 gigabytes of high performance, cost effective and reliable data storage on a pocket size Digital Audio Tape (DAT) cassette. The ClubMac DAT/2 has a significant number of key features which make it adaptable to a wide range of user environments and system applications, including:

- 20 sec average data access time (60m tape)
- 28mb/min backup rate, 366KB/sec transfer rate
- MTBF of 180,000 hours
- ONE Year Warranty
- Includes Retrospect Remote v.2.0 (3 pack) Network Backup Software and ONE 120m Tape Cassette

FREE RETROSPECT REMOTE V2.0 BACKUP SOFTWARE ($249 VALUE)



4-8GIG	ClubMac DAT/2	DDS-2	60m, 90m, 120m	$1329	$1379

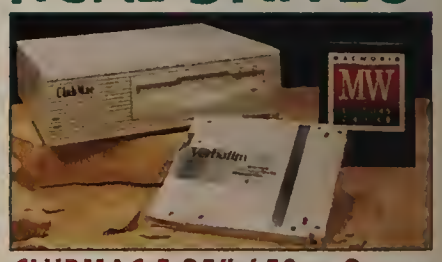
Verbatim MEDIA PRODUCTS

DAT TAPES	ea	10 pack
4mm (60m)	$12	$110
4mm (90m)	$15	$125
4mm (120m)	$25	$225

OPTICAL MEDIA	
3.5" 128mb	$35
5.25" 594mb/652mb	$89
5.25" 1.2GIG/1.3GIG	$115

CLUBMAC OPTICAL DRIVES

CLUBMAC 3.5" 128MB OPTICAL
"Low price and all-around value characterize this 128mb rewritable drive."
-Macworld Editors' Choice December 1993



CLUBMAC 5.25" 650MB OPTICAL
"Without question the best bargain among 5.25" drives."
-Macworld Editors' Choice December 1993

ClubMac 30 DAY MONEYBACK GUARANTEE

MACWORLD MW EDITORS' CHOICE

	Internal	External
ClubMac 3.5" 128mb Fujitsu Optical (M2511A)	$839	$869
Fujitsu 3.5" 128mb Dynamo		$869
ClubMac 3.5" 128mb Epson Optical	$759	$789
ClubMac 5.25" 650mb Sharp Optical	$1669	$1699
Hewlett-Packard 5.25" 1.3GIG Optical External		$2699

All ClubMac Opticals include ONE cartridge and ONE Year Warranty.

E-Machines T16 II

- 640 x 480 up to 1024 x 768
- Comp with on-board graphics on the Quadra and Centris

MacUser Magazine ★★★★ January 1993

E-MACHINES

E-MACHINES MONITORS

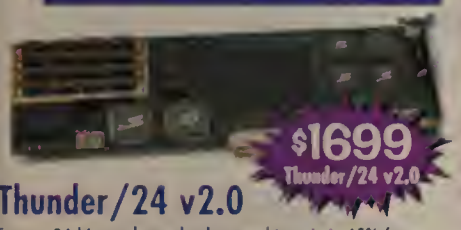
ColorPage T16II	$1139
E-Machines E20 Dual Mode Color	$1589
E-Machines T20 Multi-Mode Color	$2429

E-MACHINES GRAPHIC CARDS

24-Bit Futura II SX / LX	$419/775
24-Bit Ultura LX	$1089
Simply TV	$389

SUPERMAC

FREE DSP UPGRADE*



Thunder/24 v2.0

Fastest 24-bit accelerated color graphics. It is 45% faster. Provides high performance QuickDraw acceleration on 12-21" displays at resolutions from 512 x 384 to 1152 x 870 pixels.

24-BIT GRAPHIC ACCELERATORS

Thunder/24 v.2.0*(G1130)	$1699
Spectrum Power • 1152 (G3430)	$1189
Spectrum/24 Series IV (G2230	$799
ThunderStorm (G2930)	$429

LARGE SCREEN DISPLAYS

SuperMatch Hi-Res 20 Trin (STD9745)	$2679
SuperMatch 20•T XL (ST09752-XL)	$2499
Platinum 21 Two-Page GS (STD9761)	$999
Platinum 21 Full Page GS (ST09725)	$839

MULTIMEDIA SOLUTIONS

Digital Film (DV2050)	$3249
Video Spigot NuBus (DV1030)	$369
Video Spigot LC (DV1050)	$249

RASTEROPS® CORPORATION

HORIZON 24 with DSP

$2999 Horizon 24/4mb

At 24-bits per pixel, the Horizon 24 delivers uncompromising, brilliant photorealistic color to the Macintosh. A must for prepress artists, media professional and others who count on realistic, accurate digital color for all their imaging applications.

THREE YEAR WARRANTY

MONITORS

20"/20T Multiscan (2075RO)	$2489
20/20 Multiscan Color (2020C)	$1519
21" Mono/GrayScale (2110)	$995
15" ClearVue/15 Portrait (1510)	$399

DUOMATES

DuoMate 8/16sc	$389/519

GRAPHIC CARDS

PointBoard Lightning	$779
Horizon 24	Starting at $2999
PointBoard Turbo XL	$1129
PointBoard Professional	$2399
PointBoard 8Li	$319

MULTIMEDIA

MoviePak Presenter	$1399
MoviePak	$519
MoviePak with Adobe Premiere	$1129
MoviePak2	$1549
24XLTV / 24STV	$2529/719
Video Expander II	$499

radius

ASK ABOUT THE RADIUS WORRY-FREE SERVICE WARRANTY

SPECIAL OFFER FROM RADIUS

Buy selected Graphic Cards qualify for up to a $100 rebate!

Add-on selected monitors get an additional $100 rebate!

*Both products MUST be purchased on the same invoice for the rebates to apply. No rebates apply for just a monitor purchase. Offer ends 08/31/94

GRAPHIC CARDS

PrecisionColor Pro 24X	$1249*
PrecisionColor Pro 24XK	$735*
PrecisionColor Pro 24XP	$435
PrecisionColor 24X	$884*

*After Manufacturer's rebate

MONITORS

IntelliColor Display/20	$2349*
PrecisionColor Display/20v	$1799*
PrecisionColor Display/17	$1249*
PrecisionColor Pivot	$819
Pivot Display	$565
Full Page Display (FPD)	$445
Two Page Display/20gs	$799
Two Page Display/21gs	$1005

MULTIMEDIA

VideoVision Studio	$3389
VideoVision Studio Upgrade	$1529
VideoVision (Presentation)	$1829
VideoVision (Basic)	$1515
Rocket 33	$965
RocketShare	$389
PhotoBooster	$759

NETWORKING

ASANTE

10THUB/12	10BT Hub w/12 10T, Thk & Thn ports	$465
10THUB/8	10BT Hub w/8 10T, Thn port	$229
Mini EN/SC	Thn/10BT SCSI Ether w/DT& PB cable	$297
Mini EN/SC10T	10T SCSI Ethernet w/DT & PB cable	$237
FN10TA	10T FriendlyNet Media Adapter	$65
FNTNA	Thn FriendlyNet Media Adapter	$65
MC+IIE64	Mac II & Perf 600, Thk/Thn, 64K	$139
MAC+IIET64	Mac II & Perf 600, Thk, 10BT, 64K	$139
MC3NB	Mac II & Perf 600, Thk/Thn/10BT, 64K	$189
AP1001	AsantePrint, Thk/10BT or Thk/Thn	$329

MODEMS

GLOBAL VILLAGE POWERPORT (PWRBKS)

Mercury/Bronze/Silver/Gold ... $329/95/255/279

GLOBAL VILLAGE TELEPORT (Ext. Desktop)

Mercury/Bronze/Silver/Gold ... $329/95/255/279

SUPRA MODEMS

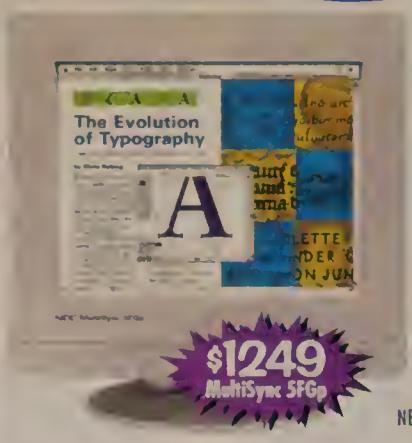
SupraFaxModem 14.4 LC ... $159
V.32bis, V.42bis w/FAXstf & Micro

SupraFaxModem 14.4 ... $225
V.32bis, V.42bis w/FAXstf & Micro

SupraFaxModem PB 14.4 ... $225
V.32bis, V.42 Internal for Powerbook

We ranties All items manufactured by ClubMac are returned to ClubMac for warranty repair. All other items carry manufacturer's warranty. Money Back Guarantee: All products manufactured by ClubMac carry a 30 day money back guarantee. ClubMac extends all other manufacturers return policies to its customers. Non-ClubMac products carry 30 day money back guarantee when specified. Returns. Call for RMA number! Any product that is returned WITHOUT an RMA number will be refused. All product information and prices are subject to change without notice. Not responsible for typographical errors.

NEC



NEC MULTISYNC MONITORS

15" MultiSync 3V	$529
15" MultiSync 3FGe	$599
15" MultiSync 4FGe	$719
17" MultiSync 5FGe	$1099
17" MultiSync 5FGp	$1249
21" MultiSync 6FGp	$2369
MacFG 24X /24Xp	$1199/479

NEC Monitors carry a THREE Year Warranty.
NEC MacFG cards carry a ONE Year Warranty

MACWORLD MW EDITORS' CHOICE October 1993 NEC MultiSync 5FGp

NEC PRINTERS

Silentwriter 640 (6ppm, 300 dpi, PS Level 2, 52 fonts)	$799
Silentwriter 1097 (10ppm, up to 600 dpi, PS Level 2)	$1379

NEC Silentwriter 640 carries a TWO Year Warranty. NEC Silentwriter 95f and 1097 carry a ONE Year Warranty.

NEC CD-ROM READERS

	w/o bundle	w/bundle
MultiSpin 3Xe (External, 195ms access time)	$589	$689
MultiSpin 3Xi (Internal, 195ms access time)	$499	$599
MultiSpin 3Xp (Portable, 250ms access time)	$439	$539
MultiSpin 4X Pro (External, 180ms access time)	$935	$1035

ClubMac's CD Bundle includes: Mayo Clinic
- Toolworks Encyclopedia v6.0
- The Animals
- Atlas Pack (World & US)
- Lucas Game Pak II
- Pair of Quickshot Speakers

HEWLETT PACKARD

Authorized Dealer

HP DeskWriter 310

- 300 dpi
- 3 ppm, 35 scalable fonts
- Light weight, only 4.3 lbs.
- Built-in LocalTalk/Serial interface
- Optional Color Kit Available

HP DeskWriter 310 include a ONE Year Warranty
HP DeskWriter Family include a THREE Year Warranty

MacUser Magazine ★★★★ February 1994 HP DeskWriter 310

HP DeskWriter 310 ... $299
Optional Color Kit Available

HP DeskWriter 310 ... $369
with Cutsheet Feeder (60-sheet), Optional Color Kit Available

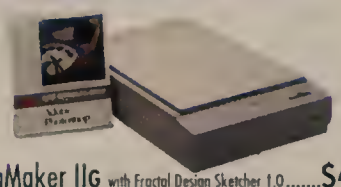
DeskWriter ... $289
300 dpi, 3ppm, 35 scalable fonts, LocalTalk/Serial interface

DeskWriter C ... $389
300 dpi color, 3ppm black, 4-7mpp color, 35 scalable fonts, LocalTalk/Serial interface

DeskWriter 550C ... $579
300 dpi, Twin-cartridge Mechanism, 3ppm, 4-7mpp color, 35 scalable fonts, LocalTalk/Serial interface

SCANNERS

MICROTEK



ScanMaker IIG with Fractal Design Sketcher 1.0	$489
ScanMaker IISP with Photoshop 2.5 LE	$799
ScanMaker II with Photoshop 2.5 LE	$665
ScanMaker IIXE with Photoshop 2.5	$1049

EPSON

MW ★★★★ August 1993

ScanTastic ps

ES-800C Pro-Mac (Scans up to 1600dpi, PhotoShop 2.5, ScanTastic, KAI's PowerTools)	$1249
ActionScanning-Mac (Scans up to 1200dpi, PhotoShop 2.5 LE & ScanTastic)	$799

DAYSTAR DIGITAL

POWERCACHE

	W/O FPU	W/ FPU
33 MHz PowerCache	$275	$359
50 MHz PowerCache	$415	$539
PowerCache Adapter*		$99

* Req'd for non-Mac IIci, Iivi, IIvx, Performa 600

TURBO 040 ACCELERATORS

Turbo 040 (with FPU support)

25 MHz Turbo 040	$749
33 MHz Turbo 040	$915
40 MHz Turbo 040	$1085
FastCache Turbo (128K cache for Turbo 040 family)	$165

Turbo 040i (w/o FPU support)

20 MHz Turbo 040i	$589
25 MHz Turbo 040i	$665
33 MHz Turbo 040i	$745

APPLICATION ACCELERATORS

Image 040 (Quadra/Centris)	$1839
Quad 040 (Quadra/Centris)	$1249
Charger (Photoshop Accelerator)	$485
Charger Plus / PFS	$639/1829

CALL FOR FREE CATALOG

VISA

No Surcharge!

ClubMac

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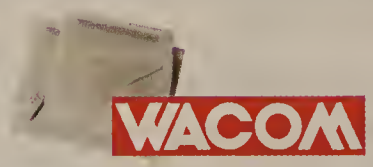
MacWorld April 1994

1-800-258-2622 CLUBMAC 1-800-258-2622

Circle 96 on reader service card

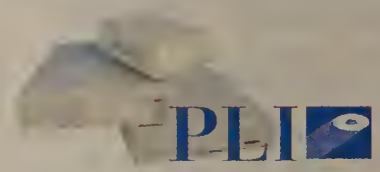
radius
Precision Color 17"
For the Best Price
Call BottomLine

Color PivotLE With Purchase of Card	$349
IntelliColor Display 20i	2329
Precision Color Pro 24X	1499
Precision Color Pro 24XP	419
VideoVision Studio	3349
Precision Color 20V	1759
LeMans GT	2299



ArtZ	$279
ArtZ Bundle	479
12x12 UD + Painter	689
12X18 Electrostatic	999
Painter v2.0 w/Tablet	199
Painter X2	71
Two Handed Input	115

PaintBoard Turbo	$1095
21" Dual Mode	2399
MoviePak w/Adobe Premier	1149
DuoMate	399
20" 20/20c Multiscan	1499
20T" Multi-Scan Trinitron	2489
15" Portrait	399



Infinity 40 R	$329
Infinity 105 SyQuest	529
Quick SCSI	309
MiniArray 1.0GB	2100
128 IBM Optical	1049
1.3GB Tahiti II Optical	3175
PLI CD ROM	569

StageTwo Rocket $949

UD1212RM Tablet $509

Horizon 24 $3649

PLI Infinity 88RW44 $489

SYSTEMS

Custom Configuration Available	
PowerPC Macs	Call
Quadra 840AV	$2849
Quadra 800	1999
Quadra 660AV	1950
Quadra 650	1999
Quadra 610 with FPU	1449
Quadra 605	849
Duo's	Call
PowerBooks	Call
Newton's	Call
Extended Keyboard w/Purchase	79

DISPLAYS

17" Trinitron	$1769
Apple 14"/16"	369/1199
Apple AudioVision	699
E-Machines T-16 II	1149
Futura II SX	419
NEC 4FGE 15"	715
NEC 3FGE 15"	595
Sigma Designs Ergo View 17"	959
15"/17"Monitor	499/749
Sony GDM 17SE1/2036S	1199/2099
Sony 1604	925
Lapis Full Page	365

SCANNERS

ScanMaker II XE / SP	$975/ 729
Leaf Scanner 35 / 45	7499/Call
Microtek 35T	1349
Tamarak 1200	1564
Tamarak 600 w/Photoshop	919
HP ScanJet IIC	1299
HP ScanJet IICX	989
Nikon Coolscan Ext. 35mm Color	1920

PRINTERS

GCC	Call
DEC Laser 1152	679
Deskwriter 550C/310	539/350
Fargo Primera	880
LaserWriter Pro 630/810	2075/4599
LaserWriter Select 360	1525
QMS 860 Plus	5299
HP 4ML/4M	1099/1989
DeskWriter 550C	669
DataProducts LZR1580	3069
3M Rainbow Dyesub	Best Price

INPUT DEVICES

Turbo Mouse ADB V4.0	$99
MacPro Plus 105	115
DGR 105 keyboard	79
Other Language Keyboards	89
PowerKey Remote	35

NETWORKING

Asante EN/SC 10BaseT	$238
Ethernet for IIsi, Nubus, LC, & SE	99
SE30 10BaseT and AUI	99
Thin/10BaseT Transceiver Adapter	$59
8 Port Hub 10BaseT, 1BNC	219
MacCon + IIET64	148
Starnet 8 10BT Hub	199
Dayna Mini Hub	234
Ether Wave	Call

DRIVES & TAPES

Granite Active Terminator	$39/59
Transportable 150 Multidisk	549
Quantum 540/ 1080 Empire	549/949
Tahoe 128 Optical	920
PMO 650 Mac Ext.	2597
1.9/ 2.5GB Barracuda Drive	1569/1919
Fujitsu 2.4 GB	1659
Toshiba 340 PowerBook	669
DGR 128/256 Optical	Call
Seagate Elite 3.4GB	2249
Quantum 1.8GB	1399

MODEMS & FAX MODEMS

Supra V.32bis LC Mac Package	$155
Datalink PB 14.4 int. V.32 bis	439
Magic 14.4 V.32 bis Datafax	149
Power/TelePort Gold	277
Power/TelePort Silver	259
Power/TelePort Bronze	95
Power/TelePort/ Duo Mercury	319
GlobalFax Duo Software	79

ACCELERATORS

TransWarp 4340 68030-128K 40MHz	$379
TokaMac 40MHz 040 FX	1699
DiimoCache 50mhz IICI	545
Newer Tech. Variable Overdrive	259
Radius Rocket 33Mhz	935

SOFTWARE

4TH Dimension v3.0	$559
After Dark v2.0	27
Aldus Freehand v4.0	369
AutoDoubler v2.0	56
Collage	189
Colleague v3.4	549
Color It! CD ROM	79
Debabelizer	275
DesignCad 2D/3D v3.0	143
Disk Doubler v3.7	49
EPS Exchange v2.0	85
Fetch v1.2	189
FileMaker Pro 2.1	243
Fontographer v4.0	249
GamePad Mac	29
MacAcademy Tapes	36
Hellcats Over the Pacific	37
Illustrator v5.0	369
In Control v2.0	80
Kai's Power Tools 2	112
Kid Pix v1.2	34
M.Y.O.B. v3.0	104
MacDraw Pro	249
MacLink Plus/PC v7.0	119

Sony Monitors

CPD 1430	$599
CPD 1730	1025

Supra Fax Modem

V.32bis MacPac	$215
V.32bis PB	219

BOTTOM LINE DISTRIBUTION
1-512-472-4956

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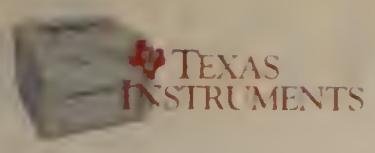
Circle 63 on reader service card



MicroLaser Pro 600 PS65	$1525
PowerStep 40 MHz Upgrade	325
microWriter PS23	679
microWriter PS65	989
1MB TI Memory	40
57 Font Upgrade	55

TI Pro 600 PS23 $1315*
includes $60 enduser rebate until 3/31/94

630LE Flatbed	$705
840 Flatbed	959
630 Flatbed	1039
630LE & Transparency	1539
Transparency Adapter	675
Auto Document Feeder	399

1260 Flatbed $1449

Turbo 040 40	$1225
Turbo 040i 33MHz	739
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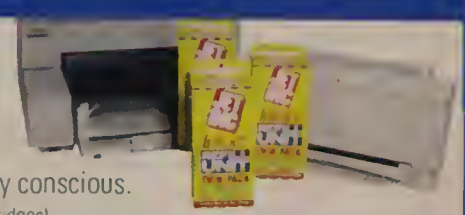

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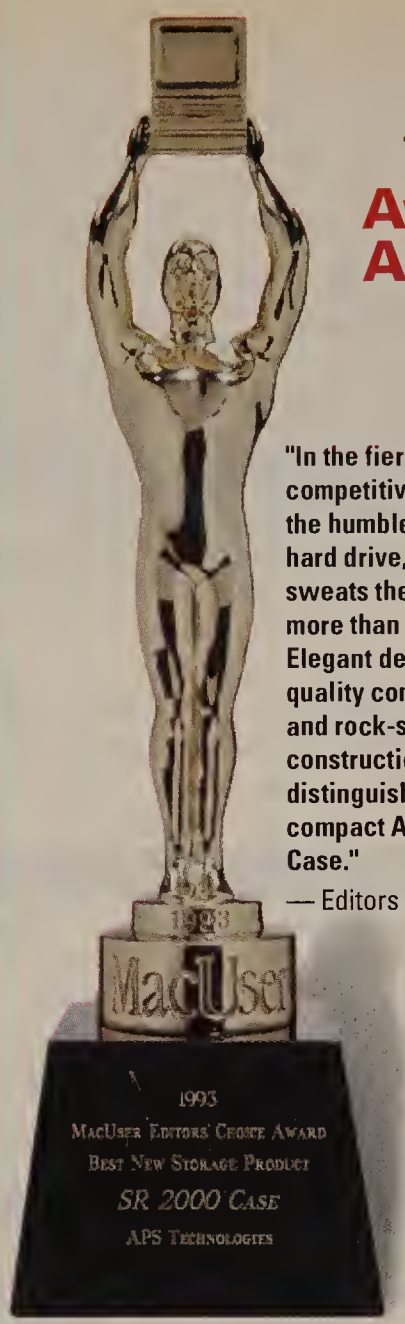

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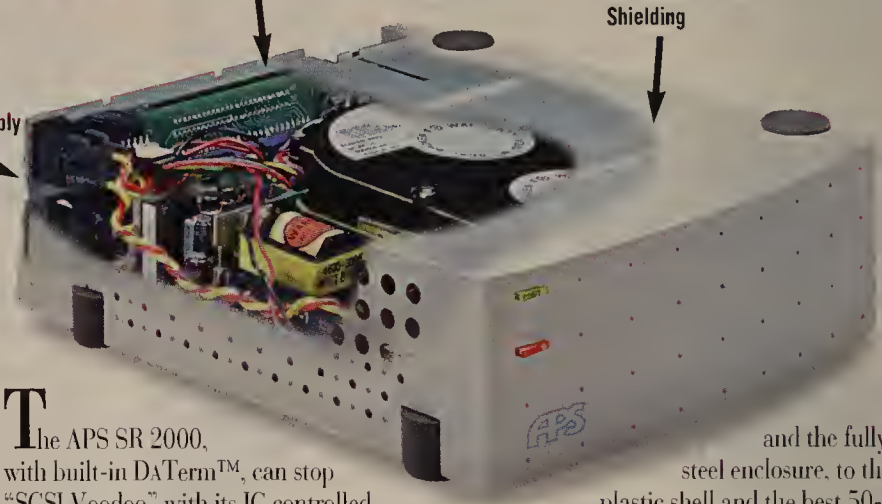

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Model	Capacity	Internal	SR2000
APS Q 127[2] Quantum 127 mechanism	122MB	$189	$279
APS 170[2] 170 mechanism	163MB	199	289
APS MX 240[2] Maxtor 7245 mechanism	234MB	259	349
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• *Internal drives for Quadra 800 and Centris 610 available.*

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APS 340[2] 340 mechanism	327MB	299	389
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APS MS 1.2AV[5] Micropolis 2210AV mechanism	965MB	1099	1189
APS MS1.2[5] Micropolis 2210 mechanism	1001MB	999	1089
APS MS 4110[5] Micropolis 2210 mechanism	1002MB	1099	1189
APS Q 1080[2] Quantum 1080S mechanism	1029MB	859	949

1183MB - 2845MB

Model	Capacity	Internal	SR2000
APS MX 1240[3]✓ Maxtor MXT1240S mechanism	1183MB	$1249	$1339
APS ST 1.6[5] Seagate ST 11950N mechanism	1611MB	1599	1689
APS MS 1.7AV[5] Micropolis 2217AV mechanism	1612MB	1449	1539
APS MS 1.7[5] Micropolis 2217S mechanism	1682MB	1349	1439
APS ST 2.0[5] Seagate ST 125500N mechanism	2040MB	1929	2019
APS MS 2.4G[5] Micropolis 1926 mechanism	2100MB	1999	2099*
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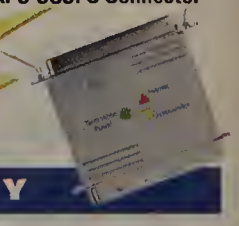

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Exclusive Digital Active Termination	✓
Provides Perfect Termination Power	✓
Drastically Reduces SCSI Retries	✓
Regulates SCSI Line Voltage	✓
Solves Cable Impedance Issues	✓
LED Activity Indicators Diagnostic Tool	✓

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Model	Capacity	LW Pro 630	Internal	Companion II AC/DC
APS PB 85[1]	80MB	$249	—	—
APS PB 170[1]	160MB	349	$299	$439
APS T 213[1]	202MB	409	359	499
APS PB 250[1]	240MB	449	399	539
APS T 340[1]	324MB	579	529	649

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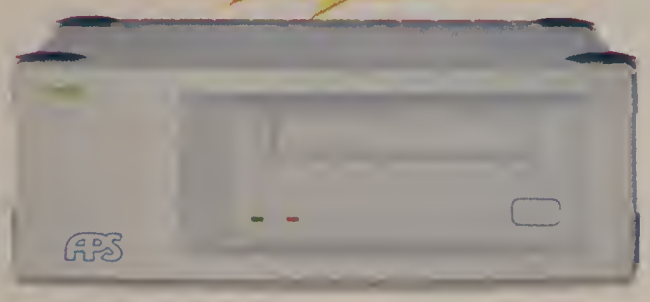
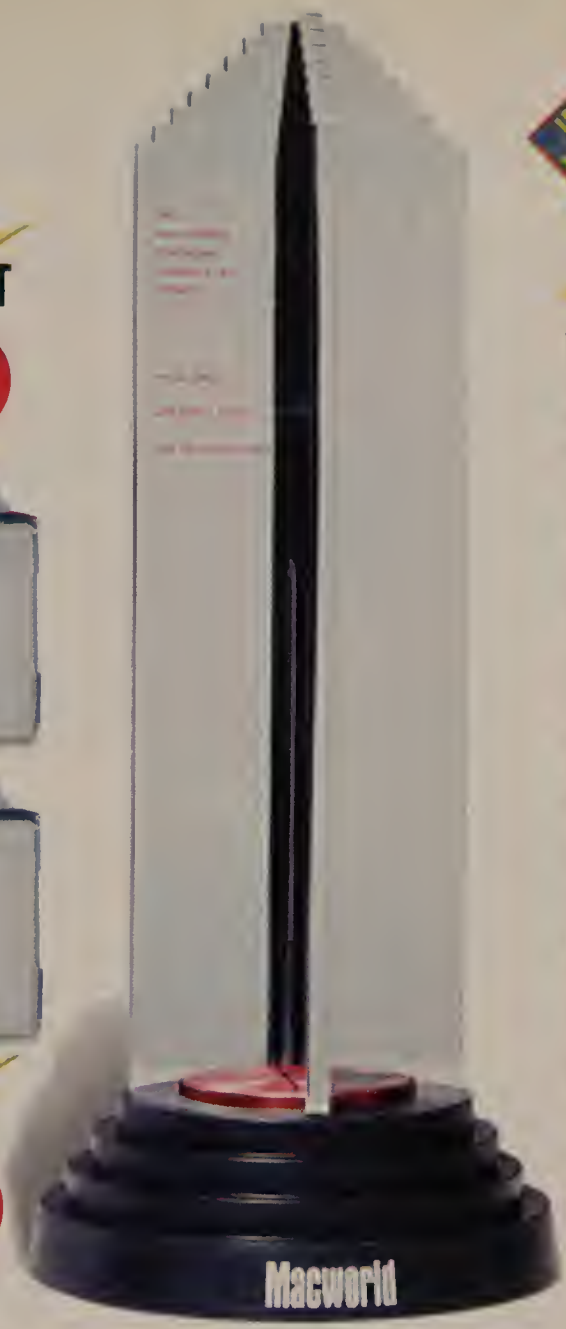


APS ProDAT $999



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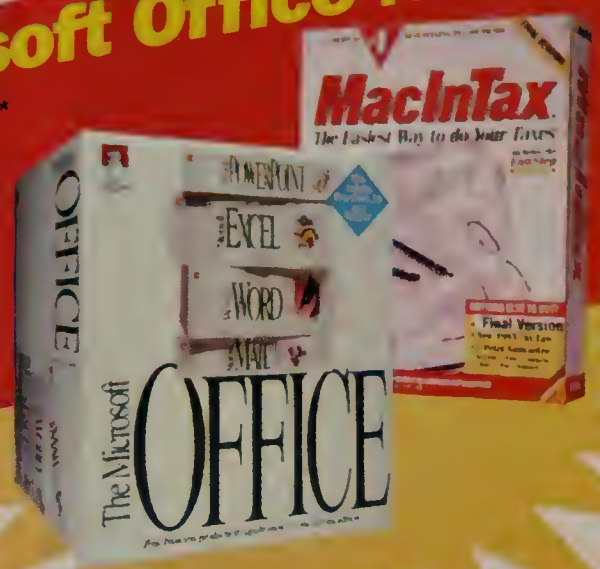

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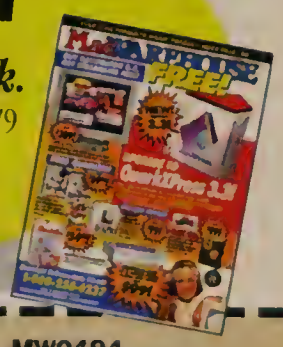

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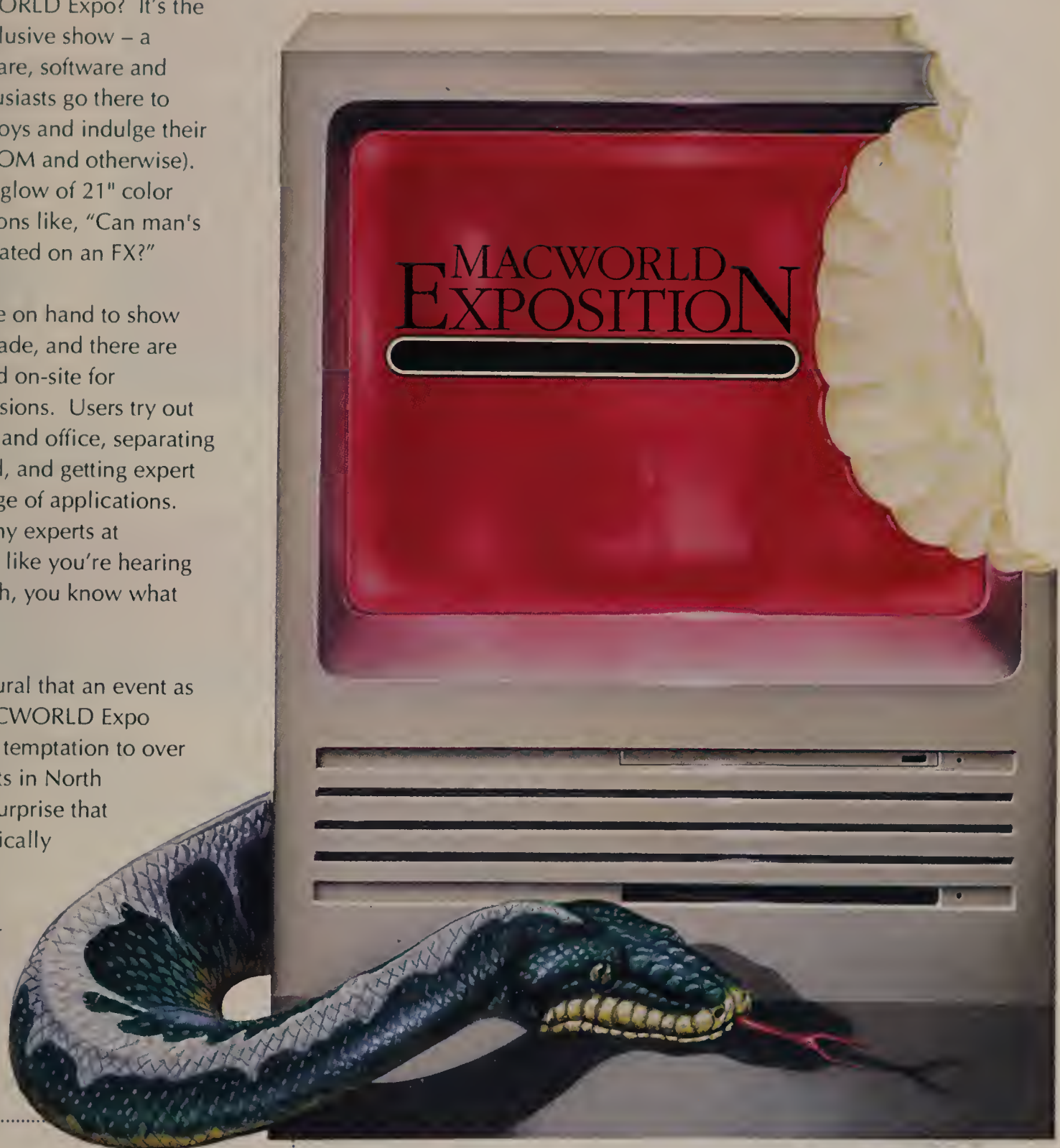

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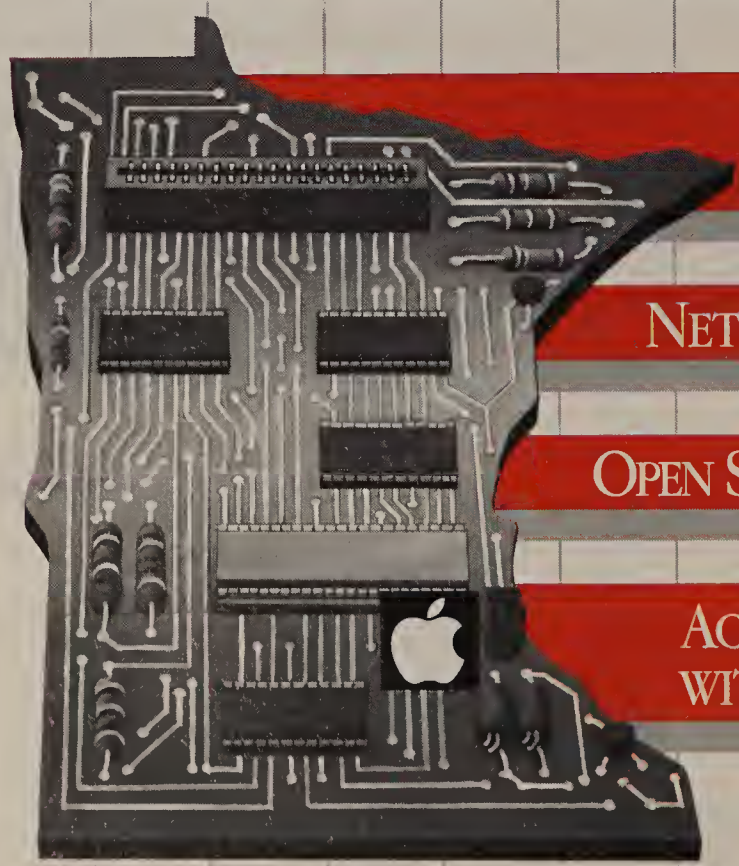

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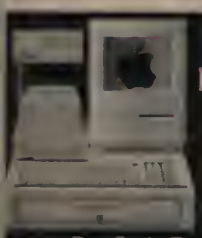

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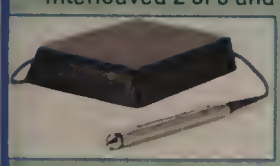

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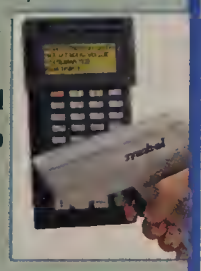

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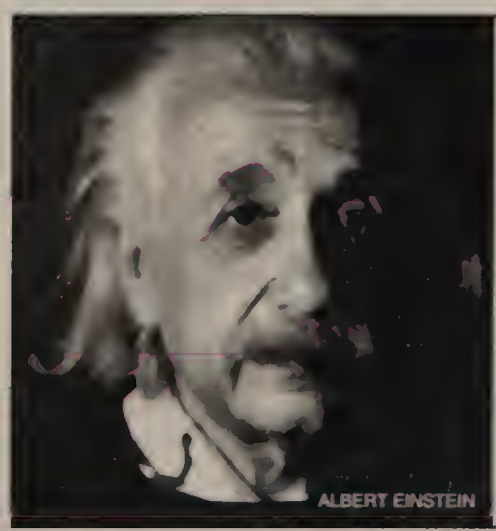

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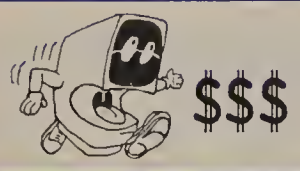

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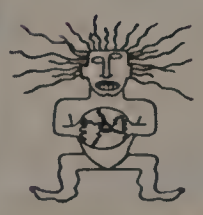

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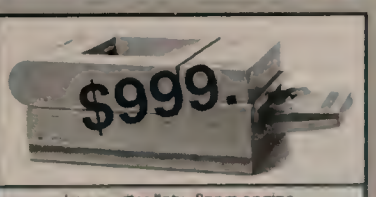

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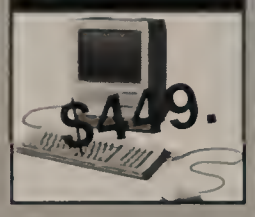

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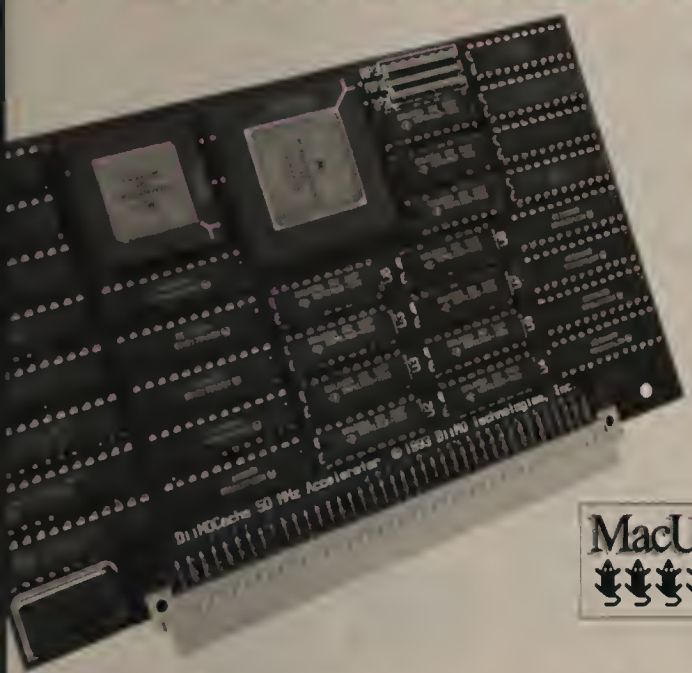

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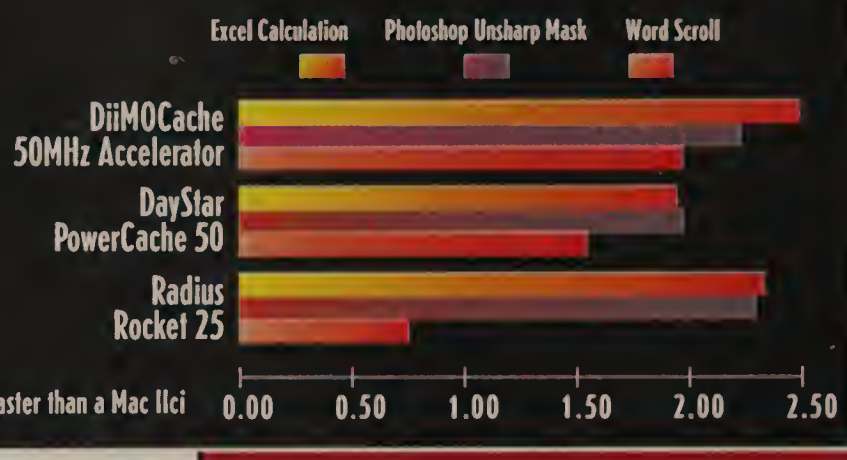

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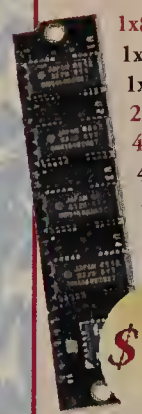

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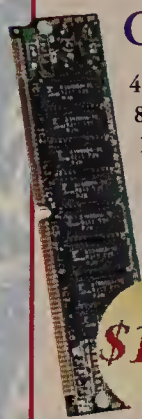

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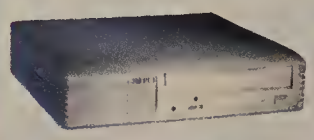

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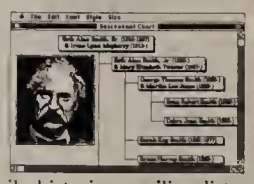

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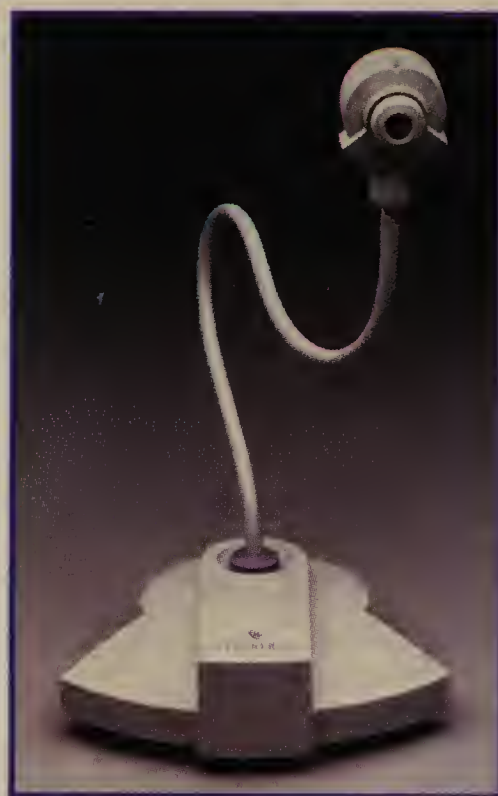

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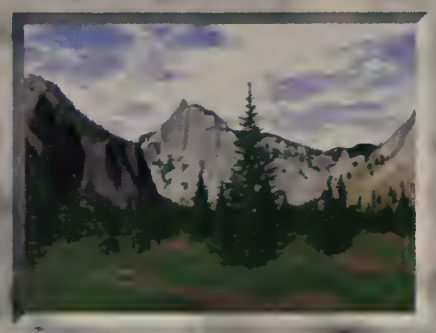

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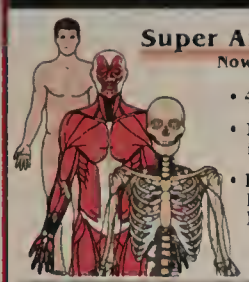

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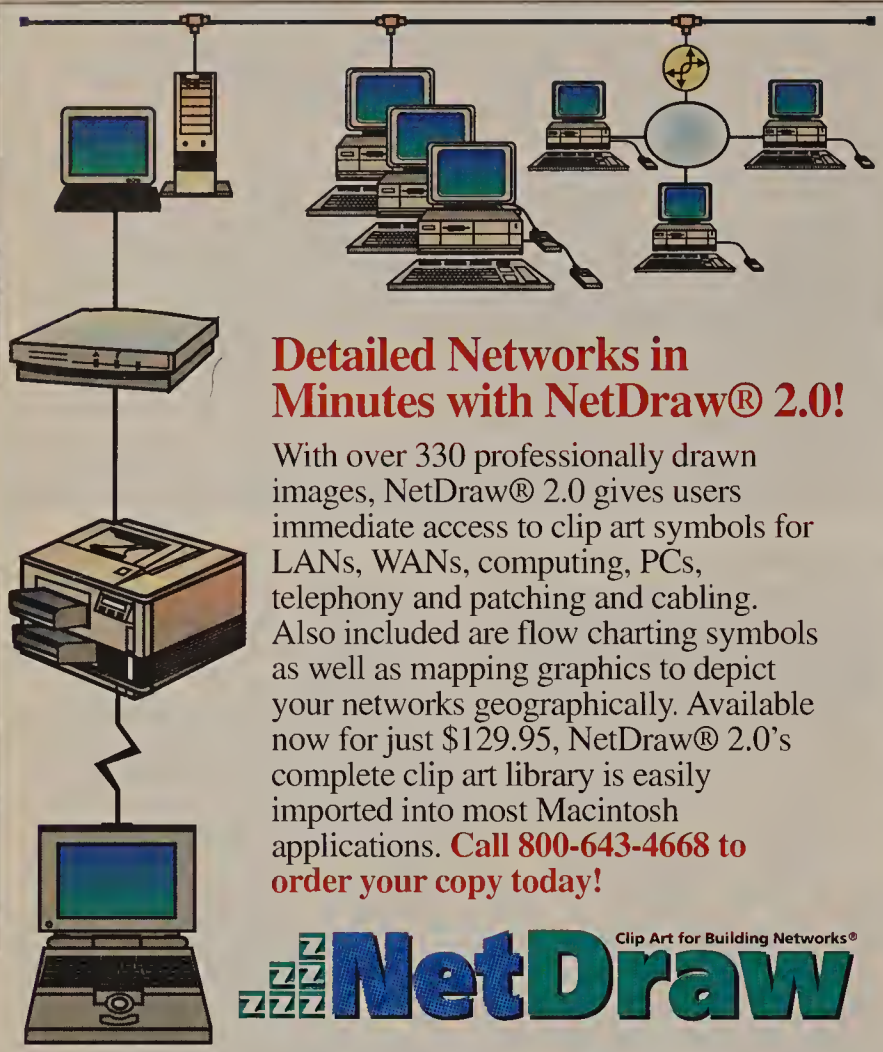

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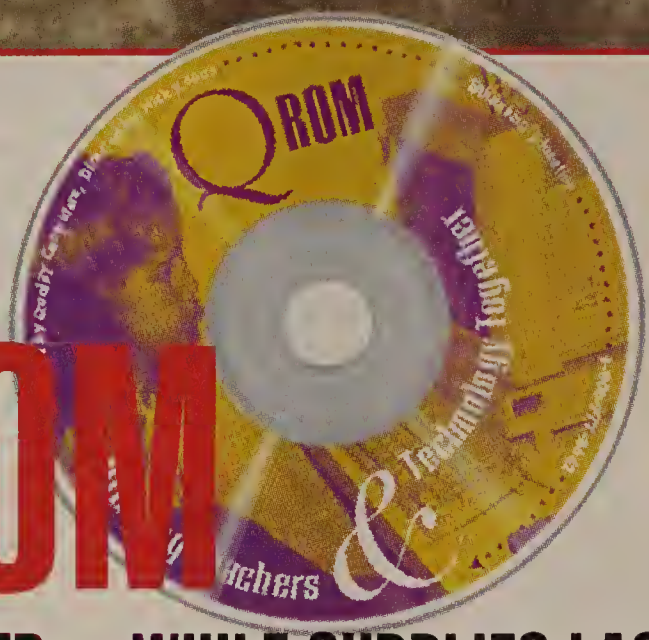

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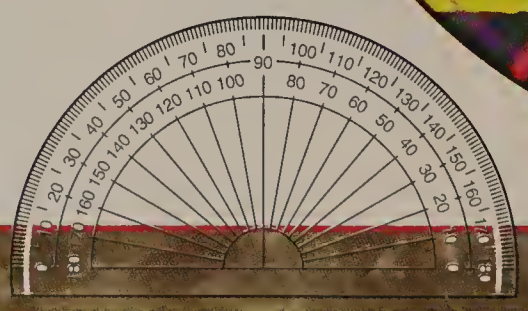

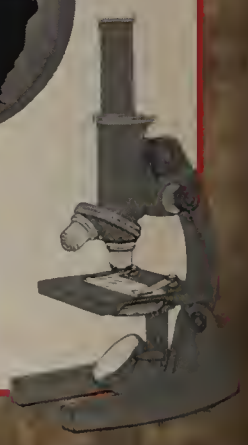

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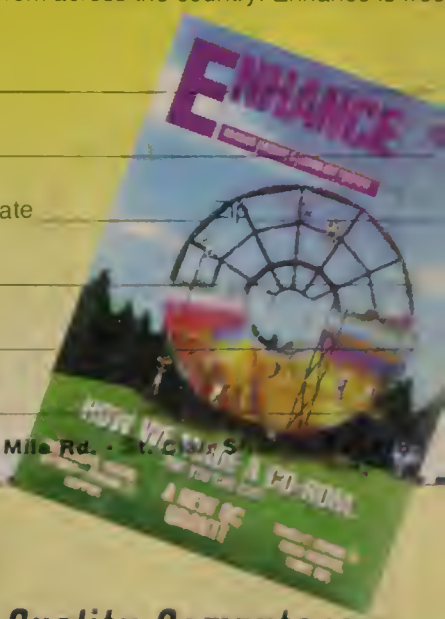

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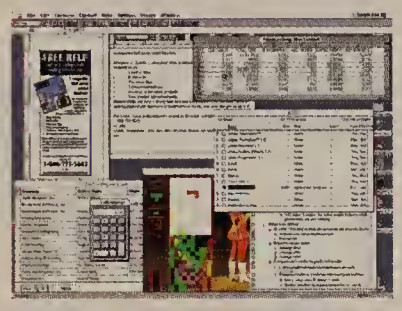

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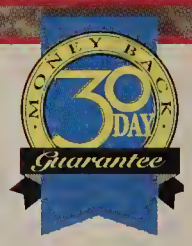

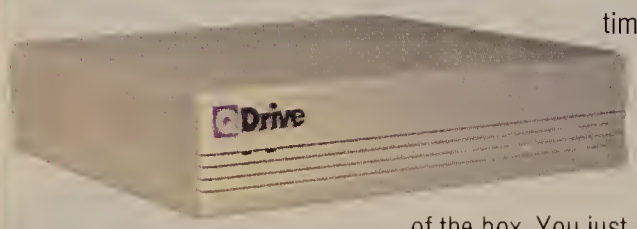

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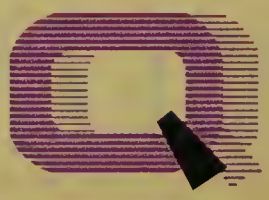

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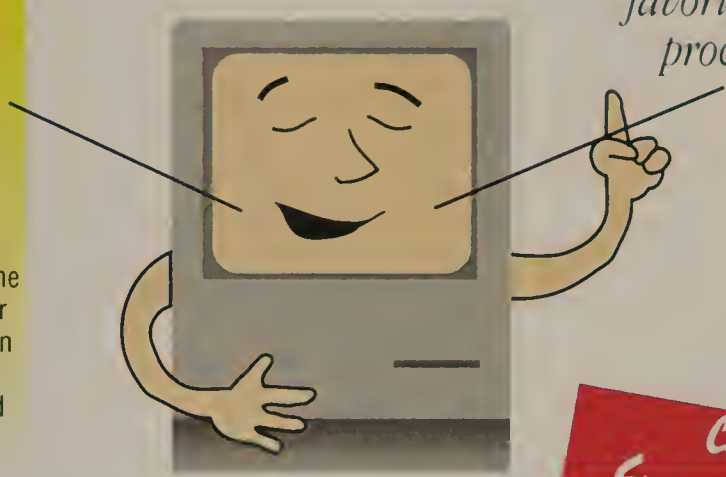

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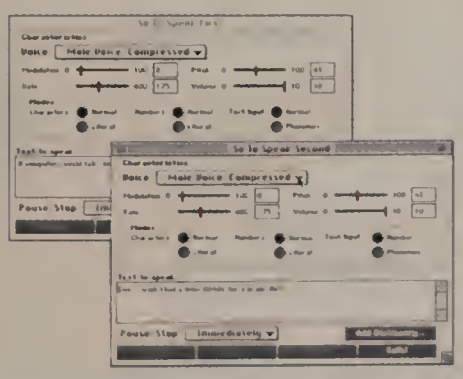

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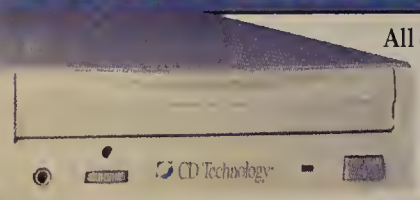

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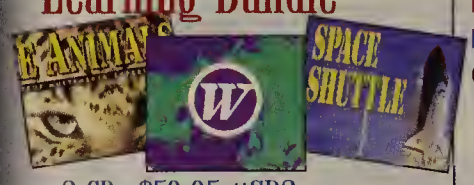

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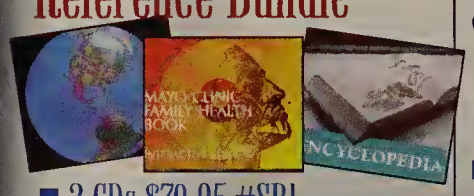

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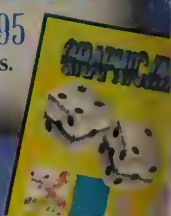

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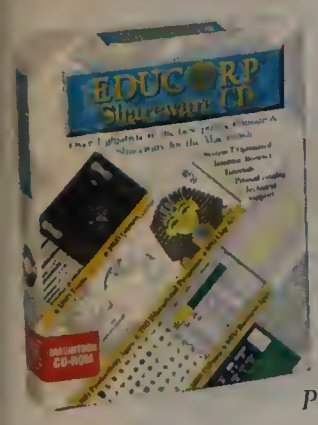

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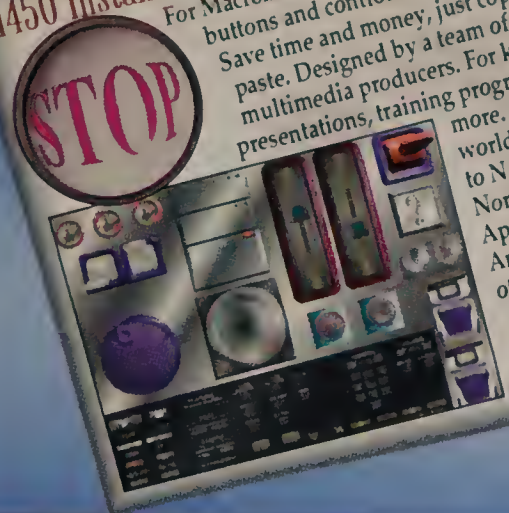

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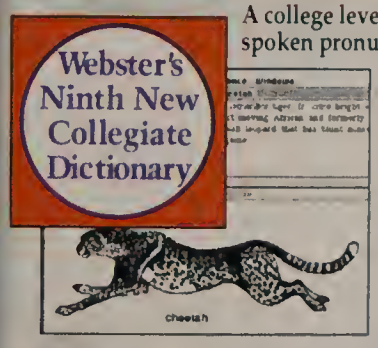

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WISE GUY

BY GUY KAWASAKI

PowerPC Predux

The toll of the new machine

LOOKING INTO MY CRYSTAL ball, I'm delighted: 1995 will be the best year in the history of Apple Computer. Unfortunately, 1994 will be the worst year in the history of Apple Computer. Let me explain why.

Overhype, Underdeliver

The day after Apple announces the PowerPC Macintoshes, everyone from your in-laws to your housekeeper is going to know that Apple introduced a revolutionary new computer. CNN will be running interviews with a 22-year-old Wall Street Charlie Sheen wannabe saying, "PowerPC is destined to save Apple."

In this case, little knowledge is a bad thing, because Macintosh buyers will not know what a PowerPC Macintosh is, but will be convinced they should buy one. This, coupled with Apple's proven inability to manufacture adequate supplies of a new computer, will stall sales. Also, if you think it's hard to figure out which Macintosh to buy now, wait until the PowerPC Macintoshes arrive.

Meanwhile, masochists like you and me—the people who read *Macworld* from back to front—are itching to buy new machines or upgrade our existing ones. Unfortunately, we know better than to buy the first iteration of a radical change like a new microprocessor, and we know that in six months Apple will drop the price or discontinue the first PowerPC model. And then there's the software-compatibility issue.

Software Incompatibilities

Initially, there will be three kinds of PowerPC Macintosh programs: those that do not run at all; those that run slowly; and those that Apple promised would ship on day one and would be "recompiled to truly take advantage of the PowerPC chip."

Early reports indicate that about 10 percent of Macintosh software isn't going to run. It's not clear how long it will take this software to be fixed. The day System 7 shipped, all new Macintoshes came with it, so there was tremendous pressure on developers to update software. The day the PowerPC Macintoshes ship, a tiny minority of Macintoshes will be affected, so there's a lot less incentive to revise software.

The other 90 percent of current software will run, according to various reports, at speeds ranging from those of a Macintosh IIci to a Quadra 700—that is, equal to or slower than what many of us have now. The solution to both software incompatibility and slowness is evangelizing software companies to rewrite their software. I believe in the tooth fairy and that John Sculley is a visionary, but this process—and resolving conflicts between new versions of the INITs, cdevs, and applications—will take the rest of calendar year 1994.

Therefore, the $68,040 question is, Who should buy a PowerPC Macintosh right away? Only two kinds of people: those who have never owned a Macintosh and won't know that their software is running slowly in emulation mode (and who won't call you for help when bugs arise); and those whose breadwinner application has actually been recompiled and shipped (as opposed to merely announced) for the PowerPC Macintosh—Adobe Photoshop for a graphics professional, for example (if, indeed, it is actually shipping).

Circa 1995

Why is 1995 going to be so great? Because by 1995, companies will have rewritten software for the PowerPC chip, and applications will run two to four times as fast as they do on today's fastest Quadras. There will also be new software that does things that weren't possible before, and developers who have been developing new products for Windows may come back to Macintosh.

Meanwhile, the Intel/Microsoft mastodon will be in a deep funk because Macintosh price/performance will blow away Pentium/Windows price/performance. Up until the PowerPC generation of software, Apple could only decrease price. Now it can also increase performance. Hallelujah for our team.

In addition, Apple has bragging rights to the statement "We have the only desktop operating system for RISC machines." There will be a version of Windows for PowerPC Macs (sold by Insignia Solutions—not Microsoft—running at 486 speeds), but it will be an afterthought for PowerPC Macintosh buyers—not a motivating factor.

Windows NT will run on the PowerPC Macintosh, but NT is, by Microsoft's own repositioned admission, only for servers. Nobody except Bill Gates's mother would buy a PowerPC to run NT on the desktop. So Macintosh will be both the fastest *and* the best game in town.

And once more it will be proven that if you wait by the river long enough, the body of your enemy will come floating by. That is, if you're still alive to see it. m

GUY KAWASAKI's views are his own and only sporadically represent those of *Macworld*. His current book is *Hindsights* (Beyond Words Publishing, 1994). He has investments in Bit Jugglers, Global Village Communication, Bookmaker Corporation, and others. He can be reached at Kawasaki@radiomail.net.

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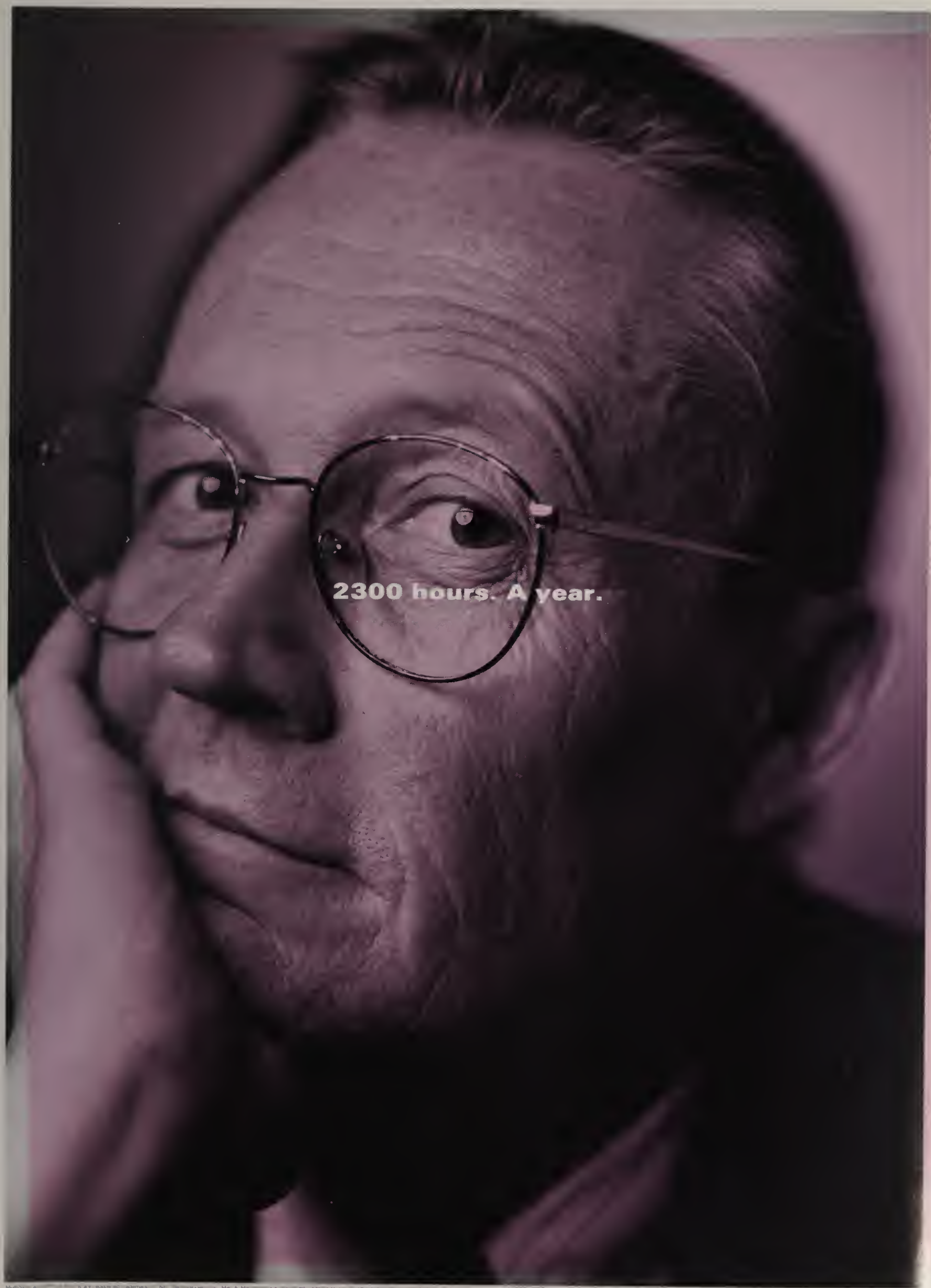
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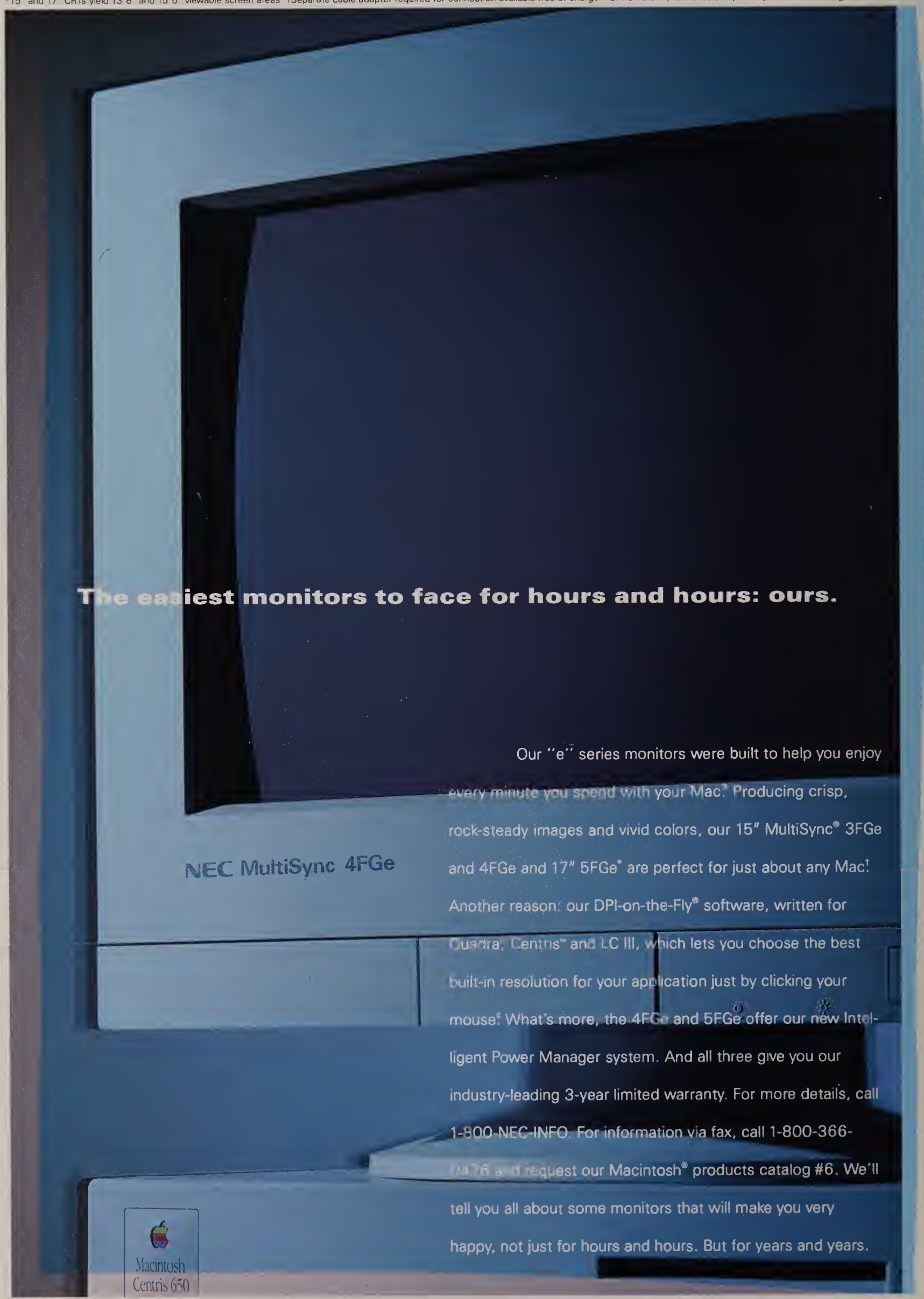

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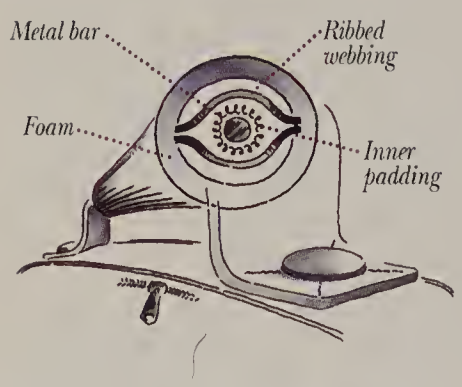

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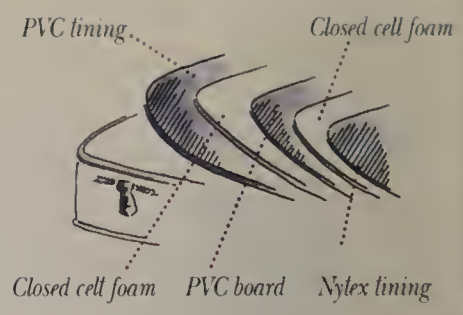

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